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HOWARD, (Henry Molyneux Paget)
[19th Earl of SUFFOLK and BERKSHIRE.]

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THE ENCYCLOPAEDIA OF SPORT AND GAMES

VOL I

From an original painting by H. Delaspre.

BLERIOT CROSSING THE CHANNEL, JULY 25, 1909.

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The Encyclopaedia of Sport & Games

EDITED BY

THE EARL OF SUFFOLK AND BERKSHIRE

A New and Enlarged Edition with Colour Plates
and Illustrations from Photographs and Drawings

VOLUME I

A — CRICKET

WITH OVER FIVE HUNDRED ILLUSTRATIONS

LONDON: WILLIAM HEINEMANN
1911

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PREFACE

The editors of the original edition of the Encyclopædia of Sport attempted to bring together the information essential to the different sports and games which constitute the pastimes of civilised man. The word "sport" had then—only ten years ago—a far narrower meaning than is given to it to-day and the editors included with some hesitation an article even on bicycling. To-day artificial locomotion on land and in the air has made such giant strides and become so much a subject of competition and emulation that there cannot be any further doubt of its proper place in an Encyclopædia of Sport. The rivalry of nations and of individuals, first on the track and then in the air, bids fair to outstrip in interest even such hallowed favourites as horse-racing, cricket, and football.

In preparing a new edition of the Encyclopædia of Sport, therefore, it was not sufficient to bring up to date the records and developments of the old games and sports, but it was necessary to add so many new subjects that the present (second) edition is not only new and revised, but has become almost a new book, with a wider scope and a larger appeal. Every article has been most carefully revised, and many new ones are added by such experts as Lord Montagu of Beaulieu, W. Baxendale, F. B. Cooke, H. A. Bryden, H. Hesketh Prichard, A. E. Shipley, Montague Shearman, J. E. Harting, B. J. T. Bosanquet, &c.

This edition is new, not only in its contents, but also in its form. The ten years which have intervened since the first appearance of the Encyclopædia of Sport have seen extraordinary developments in the arts of illustration and reproduction. For all sports instantaneous photography is the most suitable method of illustration. The cricketer is caught in the act of making a brilliant catch or driving a ball to the boundary. The golfer is shown in the very act of swinging his club ; whilst the football player, the athlete, the sprinter, the runner of Marathon endurance, the jumper, the diver, &c., &c., are caught at the most characteristic moment. And if the camera has dogged man in all his exercises, so also has it hunted down animals, right into the jungle. By flashlight lions are caught in the act of pouncing on their prey at night time ; shy beasts, like the antelope and the zebra, are shown grazing or drinking quietly at a pool ; and the furious rhinoceros is photographed as he charges the intrepid artist.

A further great improvement of this present edition over the old one is the addition of coloured plates—the reproduction of feather and fur, of beast and fowl, as it is effected by such artists as Caldwell and Archibald Thorburn, or by photographs coloured by experts from living specimens.

PREFACE TO THE FIRST EDITION

LOVERS of Sport cannot complain that in recent years their interests have been neglected by English publishers ; but, although books devoted to the consideration of Sport continue to multiply apace, no serious effort has been made to produce a national Encyclopædia of Sport.

Many editions of Blaine's *Encyclopædia of Rural Sports*, which first appeared in 1840, were published down to 1870. Blaine announced that he proposed to describe "the progress of each sport to its present state of perfection," and he acquitted himself creditably. The book was very useful in its day, but its day is past.

Football was so slightly regarded when Blaine's work appeared that he actually makes no mention of a game which is now among the most popular of our recreations. Some sports, Cricket for example, have been completely revolutionised during the last fifty years ; and others, Badger-baiting and the like, described by Blaine, have disappeared from the catalogue of national amusements, and are here relegated to the article on Obsolete Sport.

Blaine's predecessor, Strutt, published in 1801 *The Sports and Pastimes of the People of England*, which was frequently reprinted. This valuable and entertaining book, a mine of antiquarian lore, has no pretension to the name of Encyclopædia, though Strutt pursues his investigations even to the chronicling of "the obsolete sports of the young," as deduced from old engravings. Among these obsolete sports one is surprised to find games resembling "Blind Man's Buff" and "Leapfrog"; though, as the latter is apparently being played by monks and nuns, the monks giving the back, Leapfrog in that particular form may fairly be reckoned among obsolete sports.

Strutt, and to a large extent Blaine, worked single-handed ; but it is obvious that if an attempt is to be made to cover the whole range of sport, scores of experts must collaborate. The Editor is glad to say that, in answer to his appeal, the leading authorities on every branch of sport have placed their services at his disposal. In not a few cases, indeed, men who have never before published any portion of their complete and carefully acquired knowledge have been prevailed on to break through their habit of silence in favour of this work. Even the less important and unsigned articles have been submitted to insure all possible accuracy of detail to the careful revision and scrutiny of experts.

The scope of the present work is very wide, and includes many articles on subjects which, though not in themselves sport, are certainly its corollaries. Such are, for instance, "First Aid," "Taxidermy," and "Veterinary Work."

Of the first-named some knowledge should be in possession of all who take part in sport of any kind ; for what sport worthy of the name is free from danger? It is not too much to say that very slight surgical skill on the part of a servant would have prevented a fatal termination to one of the most deplorable of recent accidents on the hill.

Of Taxidermy every big-game hunter, be his object science or sport, should have at least such elementary knowledge as shall insure the preservation of specimen or trophy in presentable condition. And of the perpetual use of Veterinary work there can be no need to remind sportsmen.

Nor has natural history been neglected, though made subservient to sport throughout.

The plan of publication in parts has been adopted in the confident expectation that those who buy the earlier numbers will never rest satisfied without the complete series. The acquisition of a full-blown Encyclopædia is seldom undertaken without the misgiving born of a dread of satiety.

It may at all events be urged that this method of publication has the advantage of affording to well-wishers of Sport an opportunity of giving us the benefit of suggestions in time to correct errors or repair omissions in future numbers. Who can tell that we may not with such assistance expand in due time to the dimensions of the *Dictionary of National Biography!*

In these volumes, without any sacrifice of accuracy or technical detail, a lighter style than is usual in works of this description has been permitted, so as to render the monthly issue to the full as attractive as any of the most popular magazines. It will be allowed that the *menu* thus offered to the public is, at any rate, not lacking in variety.

The glossaries under each subject must be claimed as something of a new departure, though, of course, the facilities for reference must necessarily remain incomplete until the publication of the Index with the final number.

There are not nowadays many sports from the enjoyment of which women are excluded ; but some are considered as peculiarly within their province ; and for these such as Cycling, Lawn-tennis, &c., the services of ladies have been secured.

All the Plates, and with few exceptions the text-cuts, have been specially executed (under the supervision of Mr. Hedley Peck) for this work, which when it reaches completion will be generally recognised as a needed and valuable addition to English Encyclopædic lore.

It remains to add that the founder and architect of the scheme developed in these volumes is Mr. F. G. Aflalo, who has devoted himself to his editorial task with unflagging energy

SUFFOLK AND BERKSHIRE.

CONTENTS

PAGE

- Aeronautics (Lord Montagu of Beaulieu) 1
- Alligator (Lord Northcliffe) 36
- Ammunition (H. F. Phillips) 38
- Angling (John Bickerdyke and William Senior) 42
    - Indian (H. S. Thomas) 67
- Antelopes, Distribution of (R. Lydekker) 71
- Antelope Shooting (H. A. Bryden) . 73
    - Coursing 85
    - Snaring 85
- Archery (Col. H. Walrond) 85
- Athletics (M. Shearman) 95
    - Cross-Country Running (Harold Wade) 97
    - High Jumping (Reginald Williams) 98
    - Hurdle Racing (C. L. Lockton) . 100
    - Long Jump (C. B. Fry) 102
    - Pole Jumping (Reginald Williams) 104
    - Running (Montague Shearman) . 105
    - Steeplechasing (Harold Wade) . 109
    - Throwing the Discus 110
    - Throwing the Hammer (G. S. Robertson) 111
    - Walking, Long Distance (Fred Cotton) 112
    - Weight Putting (G. S. Robertson) 113
    - Laws and Records 115
- Automobilism (Lord Montagu of Beaulieu) 125
    - The Modern Motor (Alex. J. M. Gray) 166
    - Motor Cycling and the Machine (Alex. J. M. Gray) 182
- Badger (L. C. R. Cameron) 192
- Badminton (Arthur Southey) 195
    - In India 197
    - Laws 197
- Bandy (Arnold Tebbutt) 198
    - Rules 200
- Barbary Sheep (H. A. Bryden) 201
- Barbel 202
- Barracouta 202
- Baseball (R. G. Knowles) 202
    - Rules 211

PAGE

- Bass, Black (James A. Henshall) . . . 212
    - Measurements 215
- Bear-shooting 215
    - America, North (J. Turner Turner) 215
    - India (J. D. Inverarity) 217
    - Polar (Admiral A. H. Markham) . 218
    - Russia (Fred Wishaw) 220
    - Scandinavia (Gerard Ferrand) . 222
- Big Game 224
    - Africa (H. A. Bryden) 224
    - America, North (J. Turner Turner) 232
    - India 236
    - Measurements 238
- Big Horn (J. Turner Turner) 270
- Billiards (Maj.-Gen. A. W. Drayson and W. V. Vernon-Chapman) 271
    - Pool 301
    - Rules 302
    - French Billiards 307
    - American Pool 312
- Bird's Nesting (F. G. Aflalo) 313
- Bison (Theodore Roosevelt) 314
- Bison and Buffalo (R. Lydekker) . . 316
- Black Game (J. G. Millais) 320
    - Black Cock Tournaments (Fred Wishaw) 322
- Boar, Wild (Clive Phillips-Wolley) . 322
    - Shooting (Lt.-Col. R. Heber Percy) 326
- Bongo (H. A. Bryden) 327
- Bowls (E. T. Ayers) 328
    - Scottish (J. B. Little) 331
    - Bowling 333
    - Rules 334
- Boxing (B. Jno. Angle and Dr. G. W. Barroll) 336
- Bream 348
    - Bream—Flat 348
    - Bream, Sea 348
- Broadsword (Capt. Alfred Hutton) . 349
- Buffalo, Africa (A. M. Naylor) 355
    - India (Lt.-Col. R. Heber Percy) . . 359
- Bulls and Bull-Fighting (Walter J. Buck) 361
- Burrel (S. H. Whitbread) 369
- Bush Pig (H. A. Bryden) 371

PAGE
Bustard (L. H. Irby) 371
 African (H. A. Bryden) 373
Butterfly and Moth Collecting (C. S. Colman) 374
Camanachd (L. C. R. Cameron) 376
Camping Out 378
 Africa, South (A. M. Naylor) . . . 378
 America, North (J. Turner Turner) 380
 India (J. D. Inverarity) 383
Canoes and Canoeing (Warington Baden-Powell) 384
Capercailzie (Sir Henry Pottinger) . 398
Caribou (Theodore Roosevelt) 399
 Newfoundland (H. Hesketh Prichard) 401
Carp 402
Catapult Shooting (J. G. Millais) . . 402
Chamois (Count Schlick) 403
Char (R. B. Lee) 407
 Measurements 408
Cheeta (J. E. Harting) 408
 African (H. A. Bryden) 410
Cheetal (Gen. Donald Macintyre) . . 410
PAGE
Chickara (Arthur Pollock) 411
Chub 412
Coalfish 413
Cod 413
Conger 414
Conservancy of Rivers (John Bickerdyke) 414
Coracles (G. Christopher Davies) . . 416
 Indian 417
Cormorant (J. E. Harting) 417
Coursing (W. F. Lamonby) 419
 National Coursing Rules 421
 Greyhound Celebrities (Hon. and Rev. W. Ellis) 431
Cricket (W. J. Ford) 439
 Laws 440
 Batting (K. S. Ranjitsinhji) . . . 460
 Left-handed Batsmen (F. G. J. Ford) 462
 Fast Bowling (T. Richardson) . . 465
 Googly Bowling (B. J. T. Bosanquet) 470
 The Wicket-keeper (M. C. Kemp) . 476
 Colonial Cricket 487
  Australia (F. G. J. Ford) . . . 487
  South Africa 493

LIST OF PLATES

Blériot Crossing the Channel, July 25, 1909 . . . . *Frontispiece*
Sable Antelope . . . . *To face page* 84
Black Game . . . . ,, 320
Capercailzie . . . . ,, 398
Caribou . . . . ,, 402
Coursing . . . . ,, 420
Waterloo Cup (Supplement, 4 pages) . . . . ,, 432
Cricket at Hambledon, 1777 . . . . ,, 440

THE ENCYCLOPÆDIA OF SPORT

AERONAUTICS. — **Introduction.** — Nature suggested to man the feasibility of locomotion in the air quite as early as she afforded examples of locomotion on the water and the earth, but it has remained for the present generation of human beings to see any real and continued success attained in aerial navigation. In speed and carrying-power we have long since surpassed Nature both on sea and land, but until quite recently it could not be said that we were able to devise machines which could efficiently navigate the air.

Few scientific problems have been so baffling to successive generations, but hardly any so fascinating. To fly has been one of man's earliest ambitions, and, as he progressed from one triumph to another on land and sea, he has found it all the more galling to contemplate the vast aerial ocean where winged creatures alone could travel with ease. Almost every scientific man in every age has thought out schemes for solving the problem of aerial navigation, and the history of their failures is a melancholy but wonderful tribute to man's perseverance. Dreamers, poets, artists, and well-nigh every person with progressive ideas or imagination have yearned to emulate the birds in their easy progression through the upper air; and, as the history of the movement shows us, many people, without a grain of artistic feeling, imagination, or, indeed, mechanical or inventive skill, have developed a strange desire to build them ships of the air.

It may be opportune to first inquire into the difficulties which have so long delayed the practical stage of aerial nagivation being reached, in order that we may gain some idea of the obstacles which had to be overcome, and also to realise how hopeless it was for any real progress to be made until mechanical science had advanced very considerably in many other branches. We can thus understand the impossibility of successful aerial machines being built at a time even when land and water navigation had been much developed; and, finally, it may be borne in upon us that much of the credit which is to-day heaped upon successful inventors might with more justice be given to the earlier workers who had, in effect, devised almost similar arrangements, but who had not the necessary motive power to actuate their devices.

The air is an invisible ocean of gaseous matter, and volume for volume is, roughly speaking, one-thousandth part the weight of water. Man's proper domain is on land, and for locomotion over the earth he has been naturally fitted by ages of adaptation. He also learned in time to avail of other land animals for transport purposes. The invention of the wheel marked the first, and, indeed, the most important era in land locomotion, and since then we have progressed along the lines of making smooth and still smoother routes on which the wheels can run. To-day the line of progress is the supplanting of animal traction by mechanical traction. With routes to travel over, and with an unlimited supply of tractive power available, man had only to increase and improve this power.

As regards progression by water, the buoyant power of that fluid must have been discovered at a very early period in human history, and it must soon have been suggested to the primitive man that floating objects like trees could support an additional load, and that their carrying capacity might be further increased by making the trunks hollow. The power of the wind suggested sails, and thus, by slow evolution, man arrived at the sailing-ship, and thence to the ship in which mechanical power of a type already employed on land could be utilised for driving a ship through the water. Thus, from a very early age, man has been familiar with land and water navigation, and the lines of progress have been more or less obvious. But he has never had the power of rising into the air by his own exertions, save by bounding upwards a few feet, only to fall down heavily again. Here, in the overcoming of the always existent force of gravity, lay the problem.

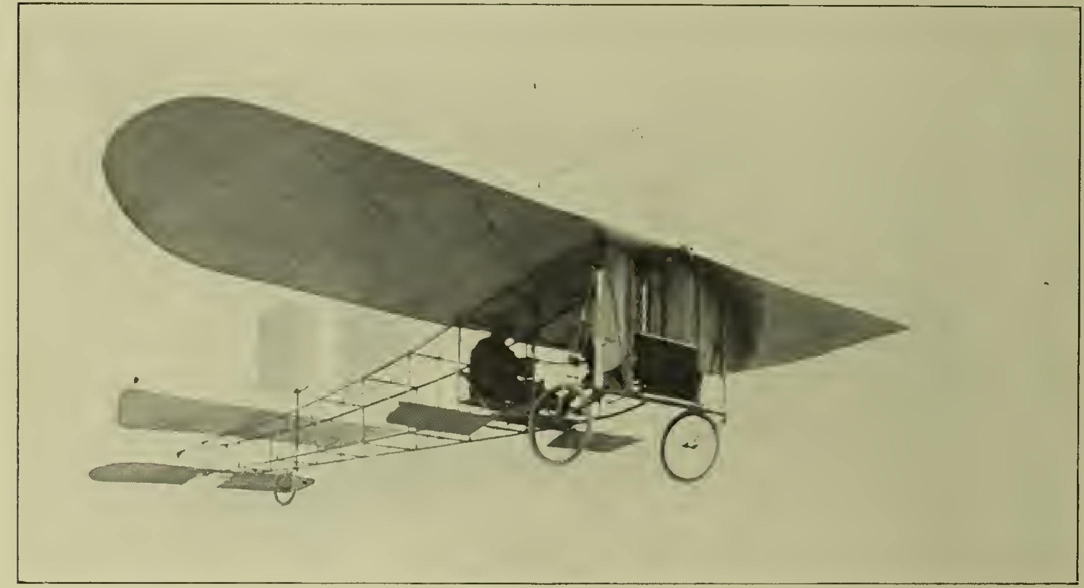
Aerial navigation must necessarily be based on observation and deduction, at least at first. The bird can fly, and the cause of its flight are its wings. But even here a complication arose as regards the pre-scientific man, for he was frequently witness of birds floating in the air with motionless wings, and rising and falling without the slightest exertion, such as those of the hawk tribe. This must have seemed mysterious, though simple enough to explain now, when kites are in the hand of every child.

The first efforts at flight naturally emulated the birds by using wing-like devices, but after a long and weary series of failures it was learned that man, by his own power, was unable to attain flight by the use of such wings, though he might glide short distances. It remained for later ages to measure the powers of various animals, and to prove scientifically that man, as compared with most living creatures, is a weakling, at any rate compared from a flying point of view.

When man came to study the navigation of the air, he found no substance at hand which could float in that medium and carry a useful load. He had thus to design a machine which, by mechanical means, would support itself in the air, and by similar means move itself through the air. In effect, a double problem had to be solved, and, were it not for the living example of the birds, man would not have attempted the task until comparatively recently.

Further study of the problem showed that to cause heavy bodies to rise in the air a good deal of propulsive power was required, which could not be provided without heavy additional weight, until internal combustion engines had been brought to a high state of efficiency.

Even now, when this power is provided, we must bear in mind that the air from its lightness and mobility is more subject than any other medium to violent disturbances, so that the aerial sea is seldom or never in a state of stagnation. Storms of incredible fierceness spring up quickly, and they are even a serious menace to locomotion both on land and water. At such times no vessel could navigate the air, and the only course open to a bird or an aerial ship would be to run with the gale or come to earth. Minor disturbances, such as squalls, gusts puffs, &c., are very disconcerting also, and by their frequency they will render the air very difficult for navigation, whilst they will, as in the past, bring disaster to many experimenters. Thus there are many circumstances combining to render the air a most difficult medium to navigate; but this very difficulty, and the attendant dangers, have but added to the fascination which the problem holds out.



BLÉRIOT MONOPLANE. THE BLÉRIOT NO. XII.

That most of the difficulties will eventually be conquered is highly probable, but it is tolerably certain that no airship will be able to give the regularity of service which we obtain in land or sea locomotion to-day, owing to the inherent fact that the air is more liable to violent disturbance than sea or land. Many other limitations exist which will conspire to narrow the scope of aerial vessels, and we must disabuse our minds of those false ideas circulated by unthinking people on the possibilities of aerial navigation superseding various forms of locomotion on land and sea. Future ages will no doubt lead to the invention of engines so light and so powerful that our most highly developed motors of to-day will compare as badly with them as human haulage compares with mechanical transport. By that time aerial locomotion will be able to avail itself of these light and powerful engines, and it is perhaps to the development of speed and power in relation to the weight of engines that we must look for the practical solution of the many problems which still remain unsolved.

Types of Vessels.—The most convenient arrangement in dealing with the subject will be to divide airships or aerial vessels into two main classes:—

(1) Flying machines, or dynamic flight machines, under which must be grouped all apparatus heavier than air. These include aeroplanes of all kinds, such as monoplanes and biplanes, helicopteres, ornithopteres, &c.

(2) Floating machines, or lighter-than-air vessels, including non-steerable balloons and dirigible balloons.

A good deal of confusion has arisen owing to the careless nomenclature adopted in many instances. Thus the term "aeroplane" is a misnomer, since the machine has curved, not plane, surfaces. Mr. Lanchester has suggested "aerodrome," but this leads to worse confusion, since the term has already been applied on the Continent to the ground where aeroplane contests are held. The scientific societies have allowed the time to pass in which suitable terms could have been selected and popularised and thus to a certain extent the current terminology must now be adopted.

Flying Machines.—In the legends of almost every great race some mention may be found of flying machines, and the history of these mythical engines would make an interesting commentary on human progress. That actual attempts at flight were made at a very early period in many countries must be admitted, but it is equally clear that not one of these attempts was successful, for they were all based on incorrect principles, and all the machines lacked the necessary propulsive power. The accounts of these legendary flights have no real importance in the history of aeronautics, since the machines used are so vaguely and imperfectly described as to convey no exact idea of the means employed. But it can be safely assumed that no successful flight was ever made, as the accounts bear internal evidence of being the imaginative work of writers who had no scientific knowledge of the essentials of a flying machine.

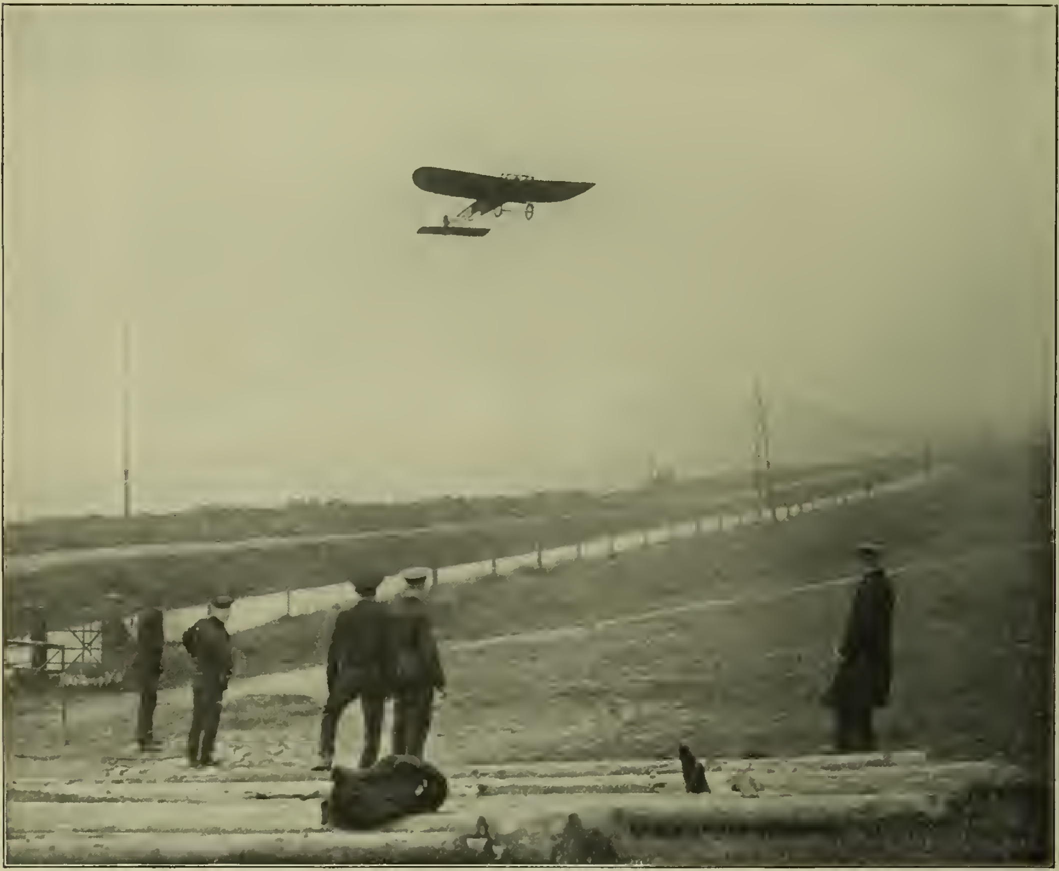
At much later periods we begin to find

BLÉRIOT MONOPLANE. M. DELAGRANGE IN FLIGHT.

indications that mechanical flight devices actually existed, and circumstantial details are supplemented by crude drawings in many cases. Not, however, until the fifteenth century do we find any really instructive attempts at flight, in which man, by mechanical means, sought to obtain power to navigate the air.

As might be supposed, the method most in vogue was to fasten wings to the body and actuate them. It soon became obvious that wings of a large size would be required, and it was but a step to the conclusion that man, by the use of his arms alone, could not move these wings in such a way as to produce flight. Experiments innumerable must have been made with wings of various sizes and shapes, and we know that they must all have failed to accomplish flight.

Leonardo da Vinci, who died about 1519, leaves us some highly interesting records of his attempts to devise an apparatus which would enable a man to use his muscular power in operating wings. He suggested a light framework to which two sets of wings were attached. These wings had flexible joints whereby the wings spread out on the down stroke and contracted on the upstroke. By an ingenious system of levers and pulleys, the operator worked the wings both by his arms and legs, and he assumed an inclined position to give forward motion. The whole contrivance is remarkable for the astute knowledge displayed, but it was doomed to failure, owing to insufficient power, and to want of other requirements which were impossible to meet at that period.



BLÉRIOT MONOPLANE.

M. Blériot arriving at Dover on Blériot No. XI., July 25, 1909, after winning the "Daily Mail" Prize of £1,000 for a Cross-Channel Flight.

From that time forward there are various authentic instances of bird-like machines having been built, though not for many years did investigators give attention to the matter of measuring wing area in proportion to the weight carried; and in every case the mechanical means adopted for producing the wing-like motion were so crude that much power was lost.

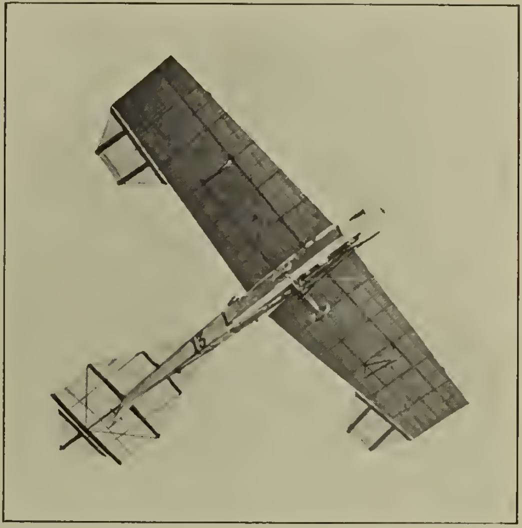
In the seventeenth century an Italian scientist, Borelli, published his conclusions on the subject of flight, and, as he expressed the opinion that man lacked the necessary energy to work a flying machine successfully by his own power, he damped the enthusiasm of many investigators over a considerable period. In the next century the work was taken up fitfully again, and several very ingenious but impracticable wing-flapping machines were built. Flights were attempted with these devices, the usual procedure being to leap off a tower or some other height. In some cases a certain amount of gliding motion was attained, and the operator descended to earth without serious injury; but the majority of the trials ended disastrously through the experimenter falling at once to the ground with terrible velocity. For reasons which will be more obvious later on, it can be asserted that no real flight was ever accomplished at this stage. Real flight would imply the feasibility of a man lifting himself from the ground by dynamic means, and transporting himself horizontally through the air in any required direction. We must distinguish between flying and gliding, as the latter merely means the gradual downward course taken by suitable bodies when projected from a height.

GERMAN MONOPLANE.

Herr Grade winning the Lanz Prize of 40,000 Marks for a Flight.

As a result of all those unsuccessful attempts at flight, experimenters had come to the conclusion that large wings were needed for human flight, but that man was not strong enough to actuate these in the proper manner. No further progress could hardly be made along this line, since at that time there was no power-producing engine capable of supplying the necessary energy in the required way.

After a long period of inactivity human ingenuity then evolved another mode of attack on the problem. It was argued that a certain amount of support in the air would be afforded by fixed wings, this idea being probably suggested by the sight of birds soaring with wings apparently immovable. To give the necessary propulsion to such a machine, movable wings were fitted, in addition. Then came the idea of getting still more bearing surface in the air by using two sets of wings placed one above the other. But not until the nineteenth century was all this thoroughly studied.



ANTOINETTE MONOPLANE.

M. Latham's Antoinette IV.

Yet another great step was made by Wenham, an English investigator, who suggested the use of fixed rectangular planes instead of wings, and, further, devised a method of employing a series of planes mounted one above the other. To him may in great part be ascribed the invention of the modern double-deck aeroplane as used by the Wrights and most other aviators to-day. Almost at the beginning of the

ANTOINETTE MONOPLANE.

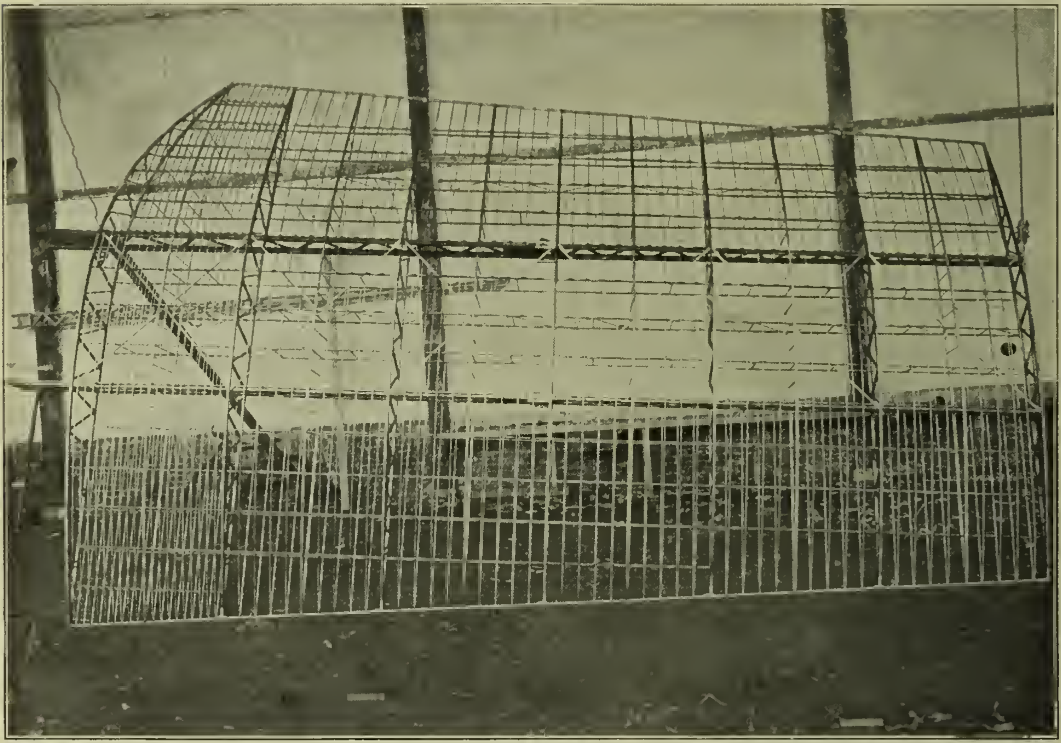
M. Latham at Blackpool.

nineteenth century Sir George Cayley had also made remarkable suggestions on the subject of flying machines, and his ideas must have influenced many later workers.

Henson, Stringfellow, and others also worked zealously to develop the flying machine, but for want of a motor they were unable to achieve very definite results. Various attempts at gliding were made, but, as a rule, the machine was not satisfactory, owing to the problem of balance not being properly understood.

Lilienthal is the next great name in the history of aviation, and he took up the work with an enthusiasm and a vigour which soon led to many radical improvements. He at first employed a single-deck glider with bat-like wings, and on this he carried out many daring glides, balancing himself by shifting his weight. He progressed to a double-deck machine, and introduced several methods for increasing the stability. Leaping off from a tower, he executed many extraordinary glides on his various machines, but it was always evident that he had not conquered the vital problem of stability. Were it possible to carry out these experiments in still air, he would doubtless have been quite successful, but, in the open, the aerial sea is almost always in a disturbed condition, and every movement tends to upset the balance of the slow-speed gliding machine. A leaf or a sheet of paper falling from a height illustrates the many conflicting currents which disturb objects in the air.

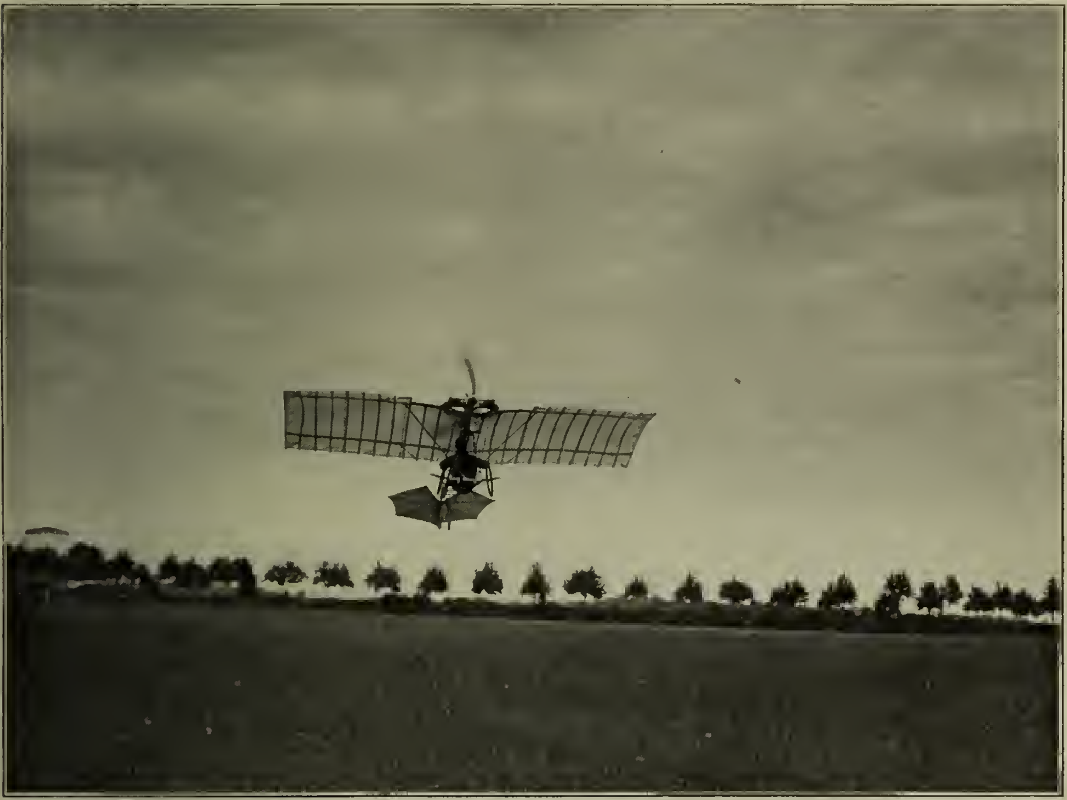
In 1896, whilst making a glide high in the air, a fatal gust capsized his machine, and he was thrown to the ground so heavily that he died from the injuries sustained. Lilienthal rendered grand service to aviation, and he wrote several works, in which he showed very sound knowledge of the principles of flight. He had intended fitting an internal combustion motor to one of his machines, and, but for the fatal accident, he would have carried his work much further.



ANTOINETTE MONOPLANE. The Framework of one of the Planes.

The school of the fixed wing and of the superposed planes had many rivals, and during the period of Lilienthal's activity numerous other plans, more or less fantastic, were brought forward for navigating the air. The wing-flapping method was returned to in many forms, vertical lift machines were proposed, and many other ideas put forward, as much to discount the gliding planes, perhaps, as to help on the movement.

Lilienthal's death, followed three years later by the death of Percy S. Pilcher, a young English experimenter who also was killed by falling from a gliding machine, put a check on practical work in Europe, and the centre of activity shifted to America, where a group of remarkable men had sprung into prominence. To Chanute, Herring, Langley, and many other Americans much credit is due for their investigations, and it was the stimulus given by them which in a measure induced the Brothers Wright to take up the subject.



SANTOS-DUMONT MONOPLANE. M. SANTOS-DUMONT'S DEMOISELLE.

In the main the Americans favoured superposed plane machines, and when the Wrights, two young engineers of Dayton, Ohio, became interested in the matter they had a definite type of machine before them. With characteristic energy and independence, however, they investigated the whole subject for themselves, and one of their first plans was to hit upon a safer method of testing these instruments.

They realised that in a fitful wind the machine would tend to lose balance, and that any aerial disturbance was dangerous to it. They also realised that a very steady wind was a helping factor, as it gave more support to the machine than still air, and enabled longer glides to be made. The quest for a suitable place for experiment led them to the coast of North Carolina, where a remarkably steady sea breeze prevails. Projecting the machine against this wind from the top of a sandhill, glides could be made with a minimum of danger.

To reduce head resistance, they adopted the plan of lying face downwards on the machine, and as they developed the glider they were enabled soon to carry out many remarkable trips through the air, and test in a very practical manner various devices for governing the stability and the control. The Wright experiments began about 1900, and about 1902 they had made several glides up to 200 yards, their longest being 622 ft.

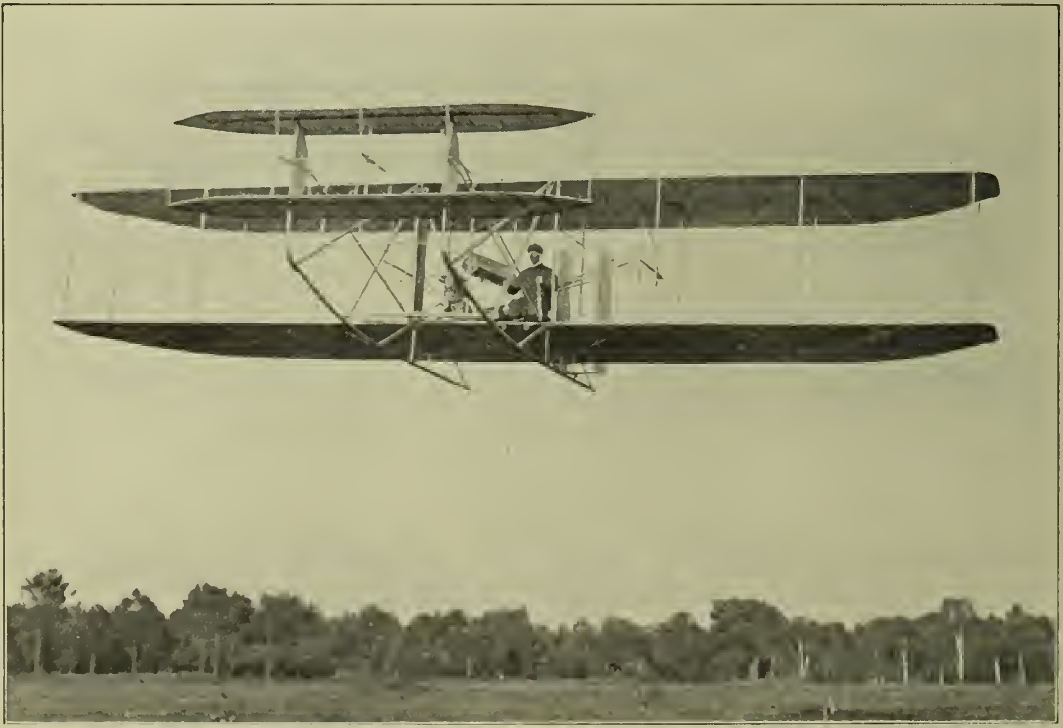
They were now emboldened to fit a petrol motor, this form of engine having at that time been carried to a high state of efficiency in Europe through the rapid growth of automobilism. The Wrights designed an engine of their own, which, though crude in many ways, gave good results; and by 1903 they fitted their engine and propellers to a double-deck machine. Later in that year they made four short flights on this the first motor-propelled flying machine ever employed.

It is worthy of note here that in 1896

Ader, in France, built a curious bat-shaped machine to which he fitted a steam engine, and with this he claimed to have flown a distance of some hundred yards. There is a good deal of doubt cast upon this performance, and his machine cannot be classed as a practical one. In 1894 Maxim built a huge aeroplane in England, and he also fitted a steam engine. This machine was captive, in that it ran on rails, and was prevented from rising into the air by another set of rails. Elaborate experiments were made in designing this machine, but whilst being tested it broke through the rails, and was badly damaged. Further trials were abandoned for various reasons, although a great deal of useful data had been acquired. It made no free flight, however, and was never proved to be a really practicable machine.

SIR HIRAM MAXIM WITH HIS ENGINE.

We can thus regard the Wright machine of 1903 as the first successful flying machine fitted with an engine, and certainly the first fitted with a petrol motor. It was necessarily very crude, and the two succeeding years were spent in improving it. By 1905 they had made flights up to 24¼ miles, still maintaining as much secrecy as possible about their work. It was their intention to sell the secret to some Great Power, but even when the aeroplane had been brought to the stage that over 20 miles could be flown, no purchaser could be found.

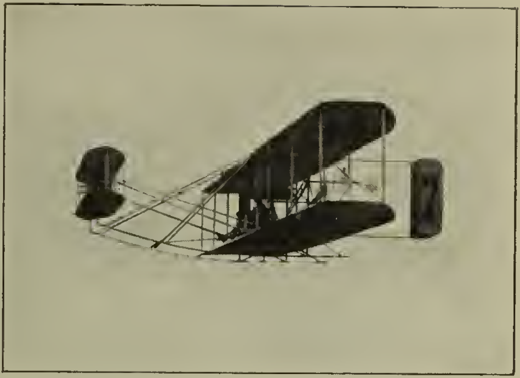


WRIGHT BIPLANE. MR. WILBUR WRIGHT IN FLIGHT.

The work came almost to a standstill in 1906; but in 1907 Santos Dumont built a small flying machine in Paris, and with this made a short flight, the first in Europe to be indisputably recorded. The subject aroused considerable attention in France, and Voisin, who had been working for several years on Chanute-type double-deck machines, was able in 1907 to build aeroplanes on which successful flights could be made. Henry Farman was the first to utilise the Voisin machine in a satisfactory manner, and late in 1907 he created an immense sensation by accomplishing several remarkable flights. Delagrange soon followed his example with another Voisin machine, and early in 1908 they had established to all the world that man could fly. From a few hundred yards the distance had been increased to seven miles in May, 1908.

A period of feverish activity followed. Biplanes of various other types were built. Blériot and Esnault-Pelterie developed the monoplane, and accomplished short flights, and various experimenters built triplanes and many other strange forms of machines. In America the Wrights had constructed several new aeroplanes, and by dint of many challenges they were compelled to come from their seclusion. One brother remained in the United States to give demonstrations before the military authorities, whilst the other came to France to prove their claims in Europe.

By September, 1908, many new records had been established, and soon the Wrights succeeded in beating all their rivals in both Continents. In America, however, the trials were brought to a tragic close by the disaster in which Lieutenant Selfridge was killed when a passenger on Orville Wright's machine. Wilbur Wright, in France, however, had no check to his progress, and he made an astounding series of flights. The last grand record was accomplished on December 31st, when Wilbur Wright travelled for 2 hr. 20 min. 23 sec., in which time he covered about 90 miles, the official



WRIGHT BIPLANE.

COMTE DE LAMBERT IN FLIGHT.

WRIGHT BIPLANE. COMTE DE LAMBERT MAKING A TURN.

WRIGHT BIPLANE. Comte de Lambert Flying over Paris—Oct. 18, 1909.

distance being 77 miles. It might here be pointed out that many discrepancies occur in aeronautical records. An aeroplane, in circling round a course staked out on the ground, swings wide at the corners, and covers a greater mileage than that shown by the official measurement. It would be better to take the mean distance between concentric courses about 100 ft. apart. Point-to-point records are not exact also in many cases, as the machines do not pursue quite a bee-line. Measurement by time occupied in the air is more equitable.

The early part of the year 1909 was devoted to the training of pupils in France and Italy by the Wrights, and although many new competitors sprang up, several months passed ere they drew within measurable distance of the famous Americans. In Canada the McCurdy machine, *Silver Dart*, made trips up to 16 miles early in the year, over a course marked out on the ice. A distance of about 1,000 miles is said to have been made by this machine during the winter of 1908-1909, and the aeroplane was the first really successful one built and operated by a British subject. In England and France aviators were very slow in getting their machines into successful trim, engine trouble preventing long flights being made.

After this lull there came in June, 1909, the extraordinary records of Latham on an Antoinette monoplane. He rapidly progressed, until early in the month he accomplished a flight of 1 hr. 7 min. 31 sec., thus beating all the records save those of the Wrights. In speed he far excelled the Wrights, and on many occasions in strong winds he made remarkable flights at speeds of close on 50 miles an hour. His feats suddenly placed the monoplane in a new light, as hitherto very short flights had only been accomplished by this type of machine. In July Latham attempted to fly across the English Channel, but failed; in the same month, however, M. Blériot accomplished this great feat. Aeroplane races at Rheims, Berlin, Blackpool, &c.; many new records in distance and altitude; and the rapid development of aviation in France, England, Germany, the United States, and other countries marked the closing months of this wonderful year.

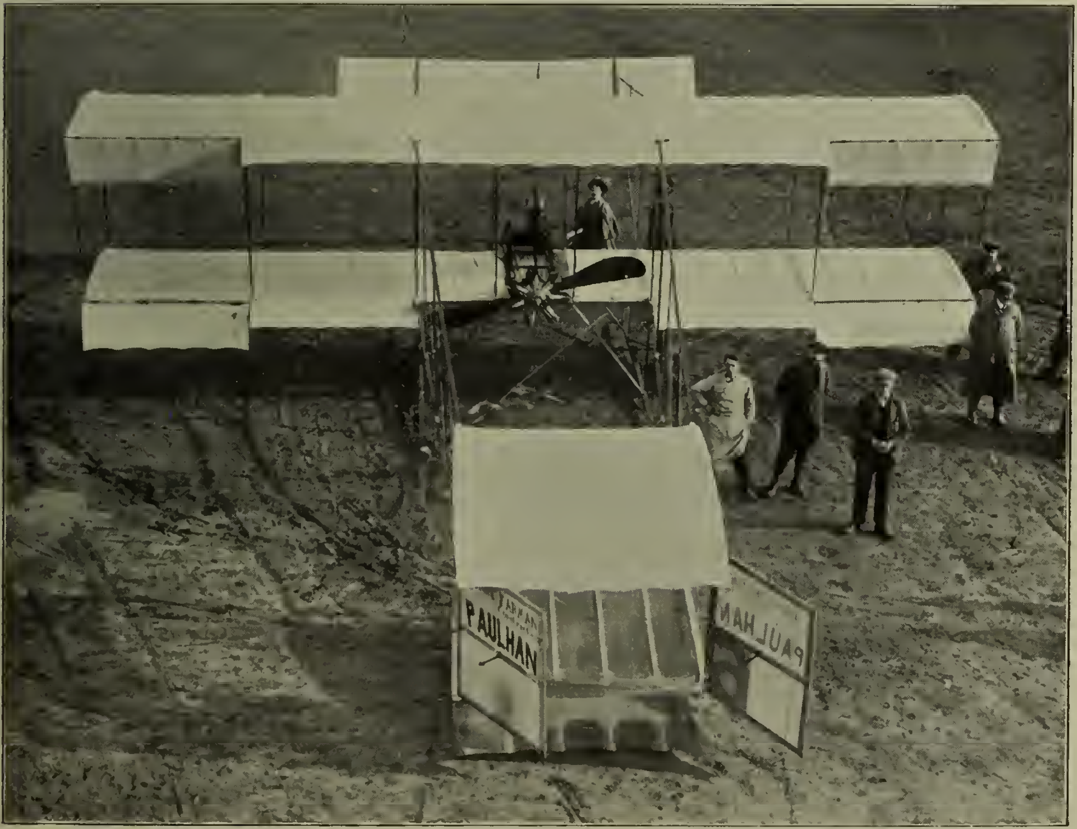
The Problem of Flight.—Such, in brief, is the history of aviation up to the present, and it shows that although some measure of success has been achieved, much still remains to be done. The many successful machines launched demonstrate that the navigation of the air is yet imperfectly understood, and the best achievements prove that many limitations exist which tend to check further progress.

In studying the subject, perhaps the first great point to grasp is that practically any body can be propelled through the air provided it is given sufficient initial velocity to overcome the natural forces which tend to draw it down. The projectile fired from a big gun is in effect a form of flying machine, making a passage through the air by reason of its enormous velocity. As this speed declines, the shell takes a downward course, until finally it comes to earth.

The aim of the flying-machine designer is to contrive an apparatus which will travel in the air with a small expenditure of power and at relatively slow speeds, thus obtaining more extended flight than if a very high speed were requisite, as in the case of projectiles. He therefore selects a light body, and gives this extended area, so as to derive increased support from the air. If we take a thin flat sheet of paper and a similar sheet which has been crumpled up to a small ball, it will be found, on dropping the two from a height, that the ball falls directly, whilst the sheet tends to go down in a zig-zag course, occupying more time, and falling to earth with less speed. By giving the ball horizontal velocity it will travel through the air like a projectile, whilst by imparting far less velocity to the flat sheet of paper it could be sent for a long distance through the air, did it not crumple up. A similar experiment, however, could be made with a flat thin plate of mica or aluminium.

Continuing this investigation further, it will be obvious that when the sheet of light material is dropped horizontally in still air its weight causes a downward pressure, and the air displaced curls upwards at its sides, producing an upward reaction. There is lifting effect here, but it is inferior to the downward pull of gravity on the sheet, and thus the latter glides gradually to earth. Here we have vertical resistance of the air acting upwards, and the weight of the plane or sheet acting vertically downwards.

If, now, the sheet or plane be tilted upwards at a slight angle, it will, as it glides downwards, encounter *horizontal* resistance to a certain extent. This horizontal air resistance will strike the plane at an angle, and will give an inclined upward thrust in opposition to the downward pull of gravity.



FARMAN BIPLANE. M. PAULHAN BEFORE A FLIGHT.

FARMAN BIPLANE.
M. ROGER SOMMER IN FLIGHT.

Could we contrive to make the aerial upward thrust greater than the downward pull, the plane would rise instead of fall, and, furthermore, it would move along a forward path. Here we get both support from the air, and horizontal motion at the same time. Obviously, the stronger the wind moving against the up-tilted plane the greater the lifting force will be; and the problem in the aeroplane is to maintain this strong current of air blowing against the machine. The same resistance is created by moving the plane rapidly through the air as moving air at the same speed against the plane.

Experimenters with plane surfaces soon discovered that the size and shape of these surfaces had an important bearing on the problem. The bird's wing formation showed that it was better to have the machine of greater width in comparison to its length. Wenham and others then proved that the aeroplane made up of long narrow planes had many advantages.

The reason for this was not quite clear until some exact knowledge was obtained of what took place in the air when a plane surface was forced through it. The theory is now well established that the air, when met by the front edge of a plane surface, has a lifting effect, but this effect is only maintained for a very brief period in any given mass of air. The analogy of the skater gliding over thin ice may serve to make this clear. By moving rapidly from point to point, a skater may travel over ice which could not support him if he remained

FARMAN BIPLANE. M. FARMAN AT BLACKPOOL, OCT., 1909.

for any appreciable period at one point. He divides his pressure over a wide area when travelling quickly, and throws the strain on any particular part for only a very brief space of time.

So, too, the aeroplane, if it moves from one portion of air to another, will continue to find support, whilst if it remained stationary it would promptly sink to the ground just as the skater would sink through the ice. The "unbroken" air first struck by the aeroplane has a resistance which gives an upward force. It then divides up and breaks into many eddies, which travel to the back of the plane, and have little supporting value.

If we took a plane 40 ft. long by 7 ft. deep, and shot it through the air with the short side forward, it would have a maximum sustaining power only across its 7 ft. side, and it would soon come to the ground, unless the velocity was maintained very high. By projecting it with the long edge forward, it has sustaining power along the 40 ft. side, and a better gliding effect is obtained. Properly balanced and set at a slight upward angle, a plane of this size can make a very gradual glide through the air, thus showing that it derives considerable sustaining force from the atmosphere.

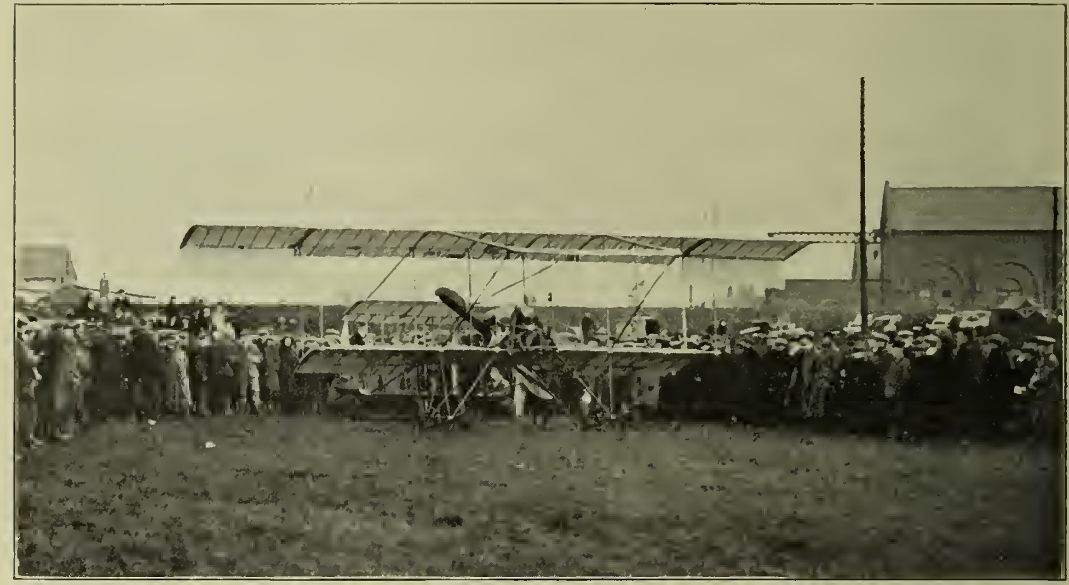
By placing another plane of the same shape above it, and a certain distance apart, an increased bearing surface is obtained, though at the expense of speed and other things. Thus experience and theory have shown that the double-deck aeroplane is a well-founded type. It can glide through the air for considerable distances, taking a very gentle downward path. The monoplane, having less bearing surface, will require more speed to keep it aloft, but is naturally capable of higher speeds with the same power.

FARMAN BIPLANE. M. GOBRON FLYING OVER PARIS.

By adding a motor which drives one or more propellers, we can force the machine through the air, and lead it from one section of air to another, so that with increasing speed the resistance of the atmosphere against the planes has an increased lifting effect, and the machine, instead of gliding down at a gentle angle, can be made to take an upward course. As the speed increases, so the machine will have increased lift, other things being equal. When the speed drops, this lift decreases, until finally a stage is reached at which the aeroplane drifts downwards, resting so long on each section of air that it drops a little ere the next section is passed to. Ultimately it reaches the ground at comparatively low velocity.

Thus the flying machine depends on its motor to keep aloft, and when the propulsive force ceases, the vessel glides to earth at an angle which depends on various circumstances. Some machines dash to the ground at a dangerous angle—that is to say, they have little true gliding power, whilst better designed instruments descend at a very gentle angle.

Birds have the power of soaring at certain times and places—that is, they can apparently remain at the same altitude without moving their wings or exerting any power, and it has been urged that flying machines will be able to avail of the same conditions.



FARMAN BIPLANE.

M. Paulhan about to Start from Lichfield for Manchester to finish his Successful Attempt to win the "Daily Mail" £10,000 Prize for a Flight from London to Manchester.

Types of Machines.—Having discussed the general principles of flight, we may now examine the different types of flying machines. They may be set out thus:—

1. Monoplanes.
2. Biplanes.
3. Multiplanes.
4. Ornithopteres, or wing-like machines.
5. Helicopteres, and vertical lift machines.
6. Various combinations of these.
7. Combined balloons and aeroplanes.

Monoplanes.—The monoplane is made up of a single main bearing surface which may be almost truly a plane, or be a curved surface, or take a modified wing formation. Strictly speaking, no flying machine in use employs plane surfaces, as in well-nigh every case the surfaces are curved, and have appreciable thickness; but it has been found convenient to describe as plane machines all those with fixed bearing surfaces of a geometrical shape, and which are practically made up of one continuous surface, as opposed to the movable wing-shaped machines, and those built up of many members.

In its present-day form the monoplane suggests the outstretched wings of a gigantic bird, the central portion forming a covered-in body which contains the aviator, the motor, and the propelling mechanism. One or more vertical fins are fitted to increase stability, and there is usually a horizontal tail for giving upward and downward direction, whilst there is a vertical rudder for steering from side to side.

As typical of the monoplane class, the R.E.P. aeroplane designed by M. Esnault-Pelterie deserves close study. Its suggestiveness of bird-like form, coupled with the excellent workmanship displayed, render it notable, and it stands out as one of the few monoplanes, except that of M. Latham, which, up to the present, have made satisfactory flight. With its single plane the R.E.P. requires high engine speed ere it rises from the ground, but once in the air it travels at greater speed than most of the double-plane machines. The centre of the machine is made up of a girder frame from which the wings spring out gracefully. The rudder is mounted at the rear of the keel, and behind it is the elevator. The extremities of the main wings can be warped for steering and balancing. The engine and propeller are mounted in front of the machine, which is thus drawn behind the propeller, instead of being pushed forward, as in the case of the double-plane machines.

Even more successful is the Blériot, the invention of M. Blériot, who may be regarded as the pioneer of monoplane flight. His machine is also of bird-like formation, and, by using high engine power, he has reduced the area of the machine to a remarkable degree. In recent trials he has carried one and two passengers, and thus has shown the extraordinary lifting power of his machine at high speed. His grandest achievement was the crossing of the English Channel. M. Santos Dumont has also carried the reduction of wing area almost to a fine art, but at the expense of stability, perhaps.

Extraordinary developments took place in June, 1909, when the Antoinette monoplane, driven by M. Hubert Latham, accomplished a series of records which placed it next in order of merit to the Wright biplane. Previously the monoplane had been able to make only short flights, and the opinion was held by rival aviators that it would never have the long-distance powers of the biplane. M. Latham, by his flight of 1 hr. 7 min. on June 5th, 1909, upset that theory, and showed the possibilities of the monoplane. Although of a newer type, the Antoinette has now surpassed the Blériot and R.E.P. monoplanes as regards time in the air, but M. Blériot has established a wonderful record by taking up two passengers with himself on a monoplane of his design. This was the first time three people had ever been carried on a flying machine.

FARMAN BIPLANE. M. PAULHAN DRIVING.

The Antoinette machine resembles the Blériot in many respects, each having the long central body, the engine and propeller in front, and the one main transverse plane. The Antoinette main plane, however, has a more pronounced curve. The elevating plane is fitted to the rear of the central body and below the rudder. Flexible extensions of the main plane are used to increase the stability. This machine has been very skilfully designed, and fitted with the well-tried Antoinette engine with steam

FARMAN BIPLANE. M. PAULHAN ON HIS WAY TO MANCHESTER JUST AFTER LEAVING LICHFIELD.

Col. Cody's Aeroplane on Laffan's Plain.

cooling and direct injection fuel system, it stands out as a well-developed machine. Curiously enough, M. Latham was for a long time the only aviator to get remarkable results from it, and the point would show that the human factor counts very much.

Biplanes.—The double-decked or biplane, with rectangular bearing surfaces, horizontal rudder, or rudders in front, and vertical rudder in the rear, is the most general type in use, and is best exemplified by the Wright and Voisin machines, which are the two main types. The front horizontal rudder is employed to control the upward and downward direction of the machine, but it is much criticised by scientific men. Steering to right or left is accomplished by the rear vertical rudder, and in the Wright machine the warping of the rear end of the main planes is used in conjunction.

The essential difference between machines of this type lies in the form of stabilising device adopted. This can be either automatic or under the control of the operator. Its object is to correct those oscillations which otherwise might wreck the machine.

We have to consider in the aeroplane longitudinal and lateral instability. The former is due to the forward and backward oscillations, which tend to pitch the vessel over nose downwards or rudder downwards. The front horizontal rudder and the rear stabiliser box in the Voisin machine are designed to counteract these movements. In the Wright machine the front rudders are relied upon.

Lateral oscillations will tend to pitch the machine over sideways to the right or the left. Thus, if a strong gust of wind blew underneath the left wing of the machine, it would lift up this side and depress the other, until the tilt was so aggravated that the machine would almost turn turtle. In the Voisin machine there are vertical panels in the main planes, which, to an extent, automatically check these oscillations, and a stabilising box at the rear made up of smaller vertical and horizontal planes also helps to attain the same end.

The Wrights, however, depend on the skill of the operator, and he is given the power of rapidly warping the ends of the main planes so as to counteract the lateral oscillations. Thus, when a strong wind lifts the left side of the machine, and thus depresses the right wing, the aviator promptly curves the left tips of the machine upwards, thus offering a smaller bearing surface to the wind at this side. The same action automatically curves down the plane tips at the right side, giving a greater bearing surface to the air, or, in other words, increasing the angle of incidence. The air meeting with more resistance at this side tends to lift the right wing, and thus the downward movement caused by the gust of wind is checked, and the machine is brought back to the horizontal.

It will suffice to study in detail two of the principal biplanes, and for this purpose we take the Wright and Voisin machines. The Wright is characterised by its all-wood frame, and has two main planes about 40 ft. wide and 6½ ft. deep. These are held apart by wooden struts, and the whole structure is well braced by wire stays. The planes are mounted on wooden runners, which take up the landing shocks. In front of the machine is a double horizontal rudder or damper for vertical steering, and at the rear is a double vertical rudder for steering from side to side.

CURTISS BIPLANE.

Mr. Glen Curtiss in Flight.

The great feature of the main planes is the warping—gauchissement—arrangement whereby the rear tips at one side are automatically curved upwards when those at the other are curved downwards. This movement is obtained by a lever moving from left to right, or right to left. It is also capable of a fore and aft movement to control the side steering of the machine. By this ingenious system of control the operator can use the flexing apparatus when executing a turn.

A second lever is fitted which governs the front moveable planes, this giving upward or downward direction to the machine. The engine is placed close to the operator, who sits at a distance sufficiently far from the centre to balance the weight of the engine, and it drives two wooden propellers by chain gearing. This method of transmission has been much criticised from the mechanical point of view, but, nevertheless. the Wrights, with a smaller power engine, have attained results which so far have not been equalled by more powerful aeroplanes. The machine, being mounted on wooden runners, requires an auxiliary apparatus to give it initial velocity. This consists of a form of catapult arrangement, the machine being mounted on a little truck which is rapidly pulled along a fixed rail by a cable when a heavy weight attached to the other end of the rope is suddenly allowed to drop. The arrangement is ingenious, but as it is not readily portable, it means that the machine has to possess a prearranged and fixed starting point. Later trials have been made with the Wright machine which showed that it could start from the rail without using the weight; and it has even been restarted by gliding over wet grass. But until some form of wheel support be adopted, the machine will be defective in this respect.

In the Wright machine the warping arrangements are coupled up with the rear vertical rudder so that both are manipulated in turning to right or left. When making a sharp turn in the air, the aviator can heel his machine over to the desired angle, and thus will swing round just like a bicycle or a motor-car on a highly banked track. Birds, in turning, will be observed to turn inwards also. The warping device of the Wright machine serves to control this tilting effect and bring the machine back to the normal. By this combined device Mr. Wright has been able to carry out many extraordinary evolutions in the air, showing a marvellous degree of control in turning quickly.

But the problem of stability in the air has yet to be solved, as even Mr. Wright admits that when a sufficiently strong gust of wind comes he will not be able to contend with it. No really satisfactory stabilising device has yet been invented, and probably the matter will have to be solved in another way by giving the machine such speed that it can move more rapidly than the gust, and

A Triplane in Course of Construction.

thus, consequently, will not be so much subject to its disturbing force. Mr. Lanchester holds that the question of speed will govern all others, and that the very fast machine capable of travelling at eighty or ninety miles an hour will have little to fear on the score of instability. But the question, however, must be carefully worked out, as provision for safety must be made at those times when high speed is not possible.

In the Voisin biplane metal tubing is largely used, and between the main and horizontal plane are vertical panels which give lateral stability. The frame is mounted on a pair of cycle wheels fitted with spring forks. In front the machine has a single horizontal plane for up or down steering, and at the rear is a box tail within which is placed the vertical rudder. A single metal propeller is used, and this is driven from the engine without chain gearing. We thus see essential differences between the Wright and Voisin machines, each point being the subject of much controversy.

Up to the present time the Voisin machine has been unable to excel the Wright aeroplane, and by many critics this is ascribed to the fact that the single propeller has to be run at much higher speed than the double propellers of the Wrights; and, as no chain gearing is used, the Voisin engine is run at high speed also. It thus loses its efficiency ere any long distance can be travelled. It is claimed for the Voisin that it has some degree of automatic stability, and that by means of its wheels it can start from almost any place. The latter is undoubtedly a great advantage, and sooner or later the Wrights may also have to adopt a similar starting device, though it will add appreciably to the weight of the machine. The Farman machine is a development of the Voisin, and in 1909 it far surpassed the Wright records. Much of its success was due to a new rotary engine employed by Mr. Farman.

Multiplanes.—The multiplanes are usually made up of three or more planes mounted one above the other; and there are some other machines in which a number of planes are mounted as radii within a cylindrical vessel. So far, they have achieved no success, and it seems probable that the head resistance they offer to the air is so great that they can never attain a safe speed. Mr. Horatio Phillips, however, is of the opinion that the multiplane machine with narrow, rectangular surfaces of non-flexible material

THE GORDON-BENNETT RACE FROM ZURICH TO GUTOWA, OCT., 1909.

will ultimately be the most successful, and no doubt can be entertained as to their great lifting power.

Of machines modelled exactly after the bird shape, there are few modern specimens, the monoplanes being the nearest approach. The classification "ornithopteres" more exactly applies to wing-flapping machines, in which great wings are actuated in various ways to give both sustaining and propulsive power. This is the so-called natural school, exponents of which urge with rather strained logic that the air can only be navigated by copying the methods of nature in every detail. They argue that the plane surfaces are wrong, that screw propellers are wrong, and that the only right course is to build bird-like shapes and fit them with flapping wings. In naval architecture similar arguments would be proved very fallacious at once.

Hitherto it has been found that the adaptation of the ordinary engine to work complicated reciprocating devices which would give wing-like motion has been very wasteful of power, and, in fact, the mechanical difficulties are so serious that the method has never been proved successful.

We finally come to the helicoptere or vertical lift machine. Whilst aeroplanes use vertical screws to give forward motion, the helicoptere machine is fitted with screws working in a horizontal plane approximately, these being designed to lift the machine almost vertically from the ground. The aeroplane rises gradually by running up a long inclined course, the resistance of the air giving the upward and sustaining effect. In the helicoptere the weight of the whole machine has to be lifted directly from the ground by sheer propeller power, and this, of course, requires the use of much more powerful screws and engines.

Several helicopteres have been designed which for brief periods have lifted with one or two men from the ground, but they have not been adapted for successful travel in a horizontal direction, and obviously a machine is of little use which can only remain at a fixed point in the air, and has no means of moving horizontally. It has been proposed to adapt the propellers so that they can be tilted to give this forward motion, but many mechanical difficulties are presented, and thus no successful type has yet been evolved. Helicopteres are given very little bearing surface, and thus when the engines fail the machines drop almost vertically to the ground. They are thus not very safe machines to experiment with.

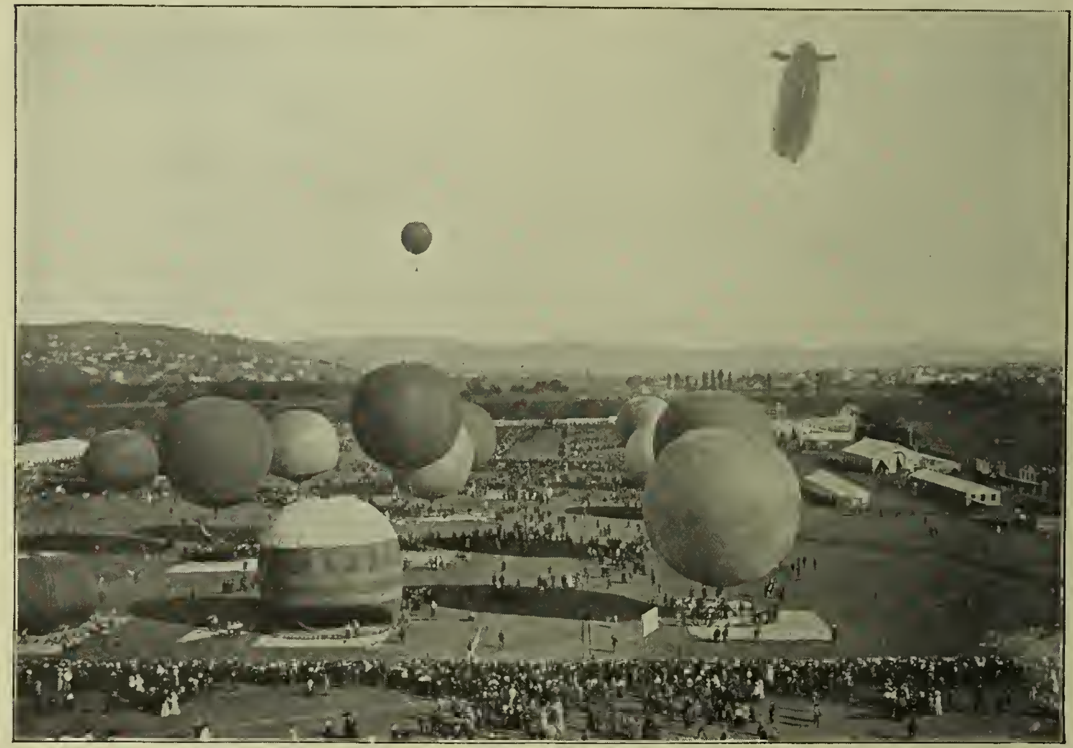
From an analysis of the various types, it is evident that there are many ways of causing a body to rise into and travel through the air, but it is also clear that most of these will have to be rejected for various causes, such as the excessive amount of power required, the limited range of action, the instability due to low speed, and other defects inherent to the particular design. What the ultimate types will be can hardly be determined yet, but it is evident that we are on the threshold of many remarkable developments.

Col. Schack on the Helvetia competing in the Gordon-Bennett Race, Oct., 1909.

Balloons.—Observation of natural phenomena must have suggested the idea of using balloons, but the inspiration undoubtedly came long after that which induced men to attempt flight by imitating the birds. The rise of smoke and heated air led many of the old physicists to experiment with these agents, and evidence is not wanting that the lifting power of gases lighter than air was known at a very early age.

But for practical purposes we must come to the eighteenth century for the most instructive applications of the idea. The brothers Montgolfier, about 1770, devised paper balloons which, when filled with smoke and heated air, rose to considerable heights. They carried the work to such a stage that animals and finally men were taken up in the air.

No sooner had this been accomplished than a new era was proclaimed in aeronautics, for writers and inventors imagined that aerial navigation was now feasible. One wild scheme after another was evolved; wars and invasions were to be conducted by balloon; and passenger services over sea and land were to be arranged. But soon it was seen that the balloon had very limited use, and even when hydrogen and coal gas were later on employed to give more lasting buoyancy to balloons, it was realised that a vessel which had no steering or motive power could not be well employed for locomotive purposes. The mistaken idea of fitting sails was adopted, and many other ingenious efforts were made by means of oars and wings to supply motive power; but they all failed, and the balloon developed merely as a drifting instrument.



THE START OF THE GORDON-BENNETT RACE FROM ZURICH, OCT., 1909. PARSEVAL DIRIGIBLE OVERHEAD.

Another Frenchman, M. Charles, improved the structure of the balloon, and practically evolved the type which we know to-day. Many details have been perfected, so that the modern balloon is a very well tested instrument, with a definite but extremely limited sphere of usefulness. Indeed, it is mainly employed for sporting purposes, and to small extent in military operations and research work.

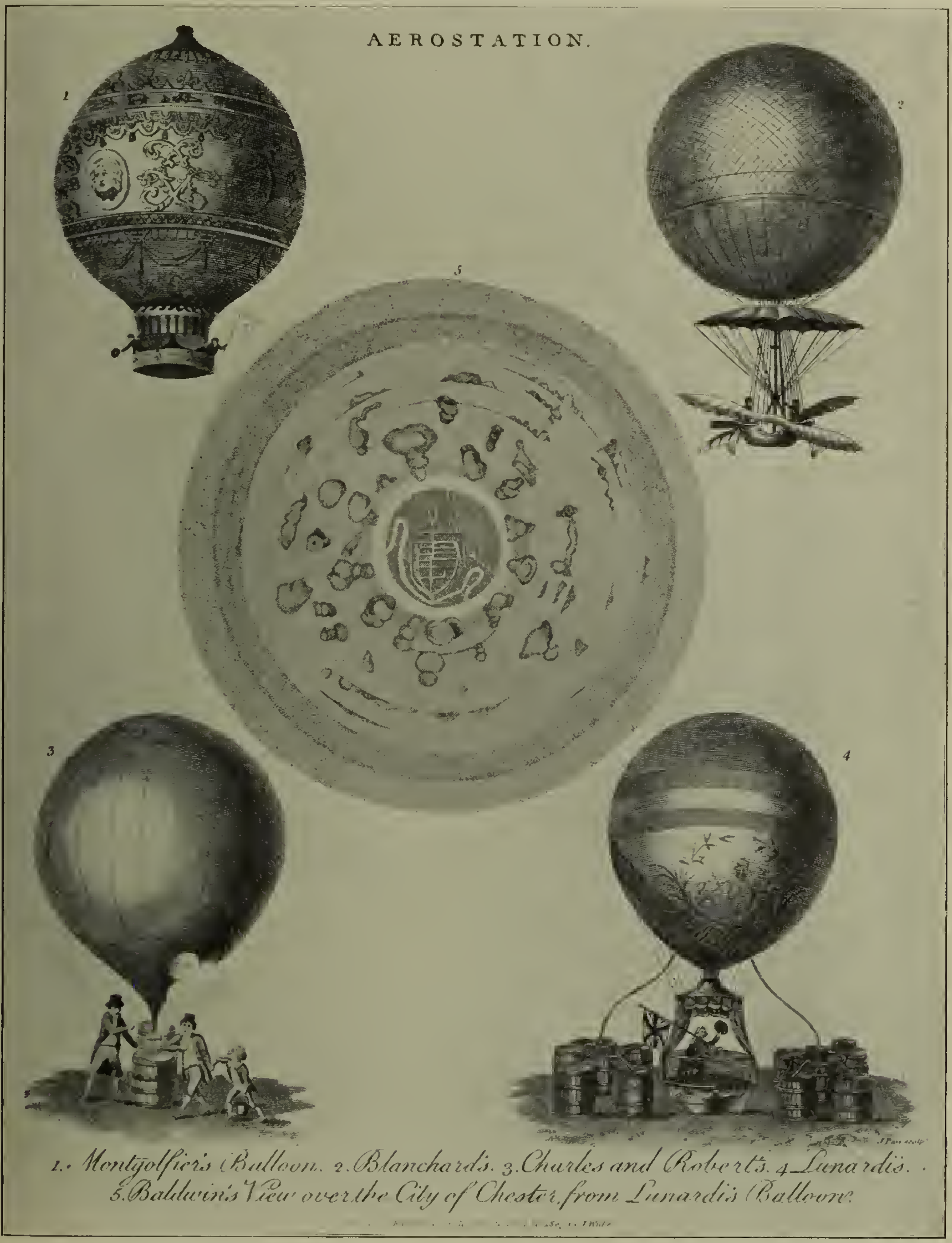
When employed in war, it has to be kept well out of the range of the enemy's guns, and in future operations it will also be subject to attack from steerable aerial vessels.

Essentially, the balloon is made up of a spherical gas bag from which a car is slung. A simple valve is fitted so that the gas can be permitted to escape when a descent is to be made. The mouth of the balloon is opened just at the moment of starting so as to permit the gas to expand without bursting the balloon, which would occur if the pressure became too great. In many balloons a ripping panel is fitted which permits of a quicker escape of gas should a very rapid descent be necessary, as, for instance, if the aeronauts found themselves suddenly heading for the open sea.

Coal gas is generally used for filling balloons, owing to its cheapness and the ease with which it can be obtained. Volume for volume, coal gas is half as heavy as air, and 1,000 cubic ft. of the gas will lift about 40 lb. at sea-level. Hydrogen is considerably lighter than coal gas, and has nearly double the lifting power, volume for volume. The air is usually heaviest or most dense at sea-level, and as a balloon rises it reaches air which is less dense, until finally

EARLY BALLOONS.

From a Contemporary Print.


AEROSTATION.
1
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1. Montgolfier's Balloon. 2. Blanchard's. 3. Charles and Robert's. 4. Lunardi's.
5. Baldwin's View over the City of Chester, from Lunardi's Balloon.

Montgolfier's balloon was the result of several experiments made by two brothers, Stephen and Joseph Montgolfier, and the first ascent was made in it in August, 1783. Blanchard's was the property of M. Jean Pierre Blanchard, who made a successful journey across the channel in it. Charles and Roberts made an ascent in their balloon from Paris in 1783. Lunardi's balloon was practically the first introduced into this country, and the ascent took place in 1784 before the Prince of Wales.

a condition of equilibrium is attained in the rarefied air of the upper atmosphere.

Bags of ballast are carried, and this can be thrown out for the purpose of lightening the load, and thus giving increased lift if this is required. There is a gradual wastage of gas, and this must be made up for by reducing the load carried. Otherwise the vessel would sink too low. Ballast also serves a very important purpose in manœuvring the balloon.

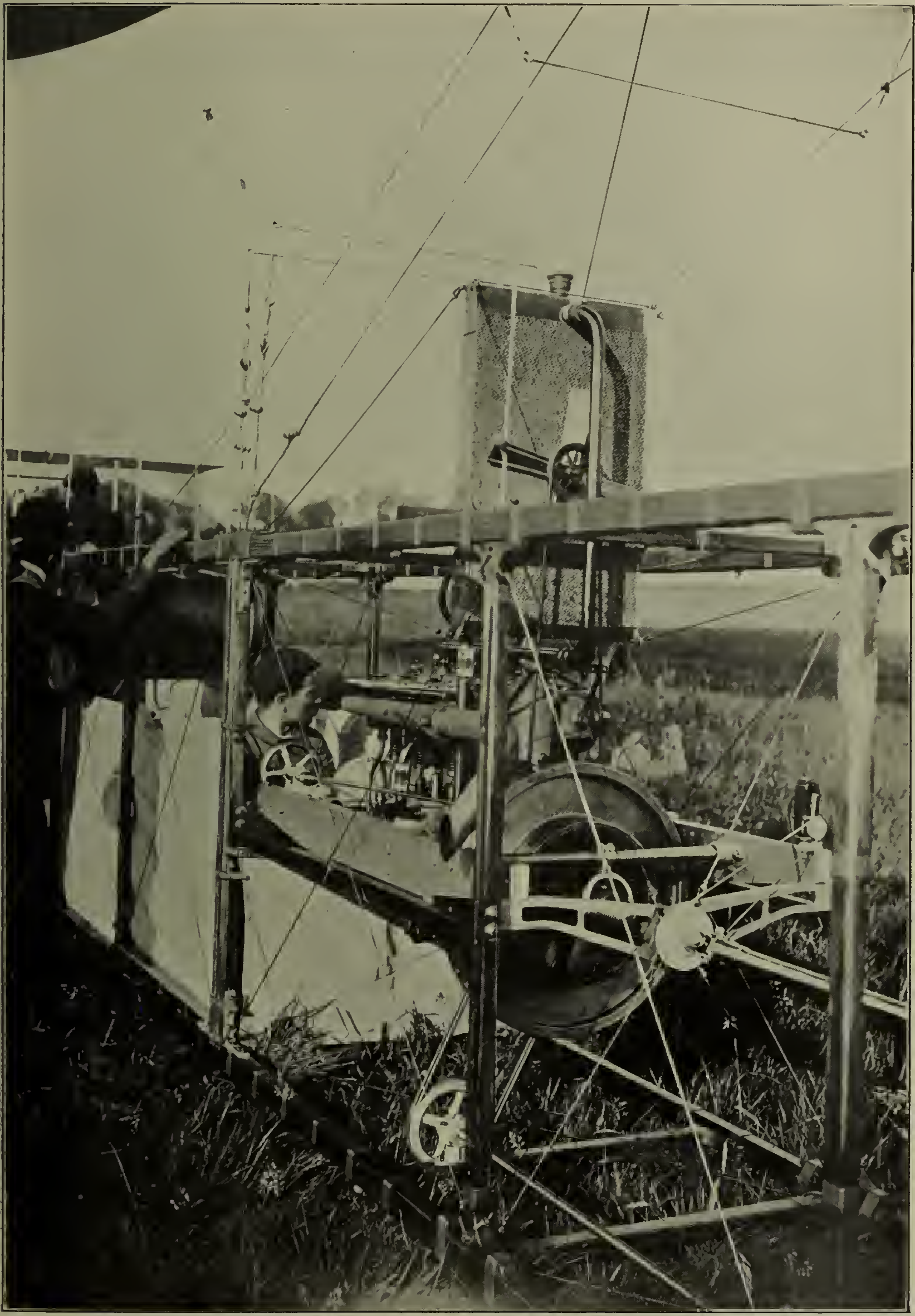
The sport of ballooning is one of the most attractive known, and, properly undertaken, it is by no means dangerous nor unduly expensive. It forms an excellent training for the more serious work of handling steerable vessels, though it does not follow that the balloonist is the best man to entrust with the latter type of vessel, owing to the many new problems introduced. Nor does it indicate that he has any special qualification for aviation, as is too often claimed.

Dirigible Balloons or Dirigibles.—The spherical balloon, by its shape, must needs meet with enormous resistance from the air if driven through it by mechanical means, and even before these means were available several designs of gas envelopes had been worked out to give less resistance. Fish- or spindle-like shapes naturally suggested themselves, and many modifications were produced, but all may be said to be shaped with blunt or pointed ends and gradually increasing towards the region of greatest diameter.

The Start of a Balloon Race at Hurlingham, May, 1909.

To spindle-shaped gas envelopes various forms of mechanical devices were fitted during the eighteenth century, in order to obtain propulsive power, but the attempts were destined to be failures until some economical and light form of motor was discovered. The lifting power of a balloon is relatively small, as we have already seen, and exceedingly light engines are, therefore, required for aerial work.

Despite many disadvantages, very remarkable results were obtained by various experimenters in the last century, and to Giffard, Haenlein, Renard, and Krebs great



THE BALLOT MOTOR OF 4 CYLINDER 40 H.P., ZODIAC III., BELONGING TO COUNT HENRI DE VAULX.

credit must be given for the manner in which they devised gas envelopes, which were well calculated to be serviceable. The proportions of the Renard and Krebs vessel were arrived at by dint of long study and experiment, and represent almost the first really scientific effort made in the building of dirigibles.

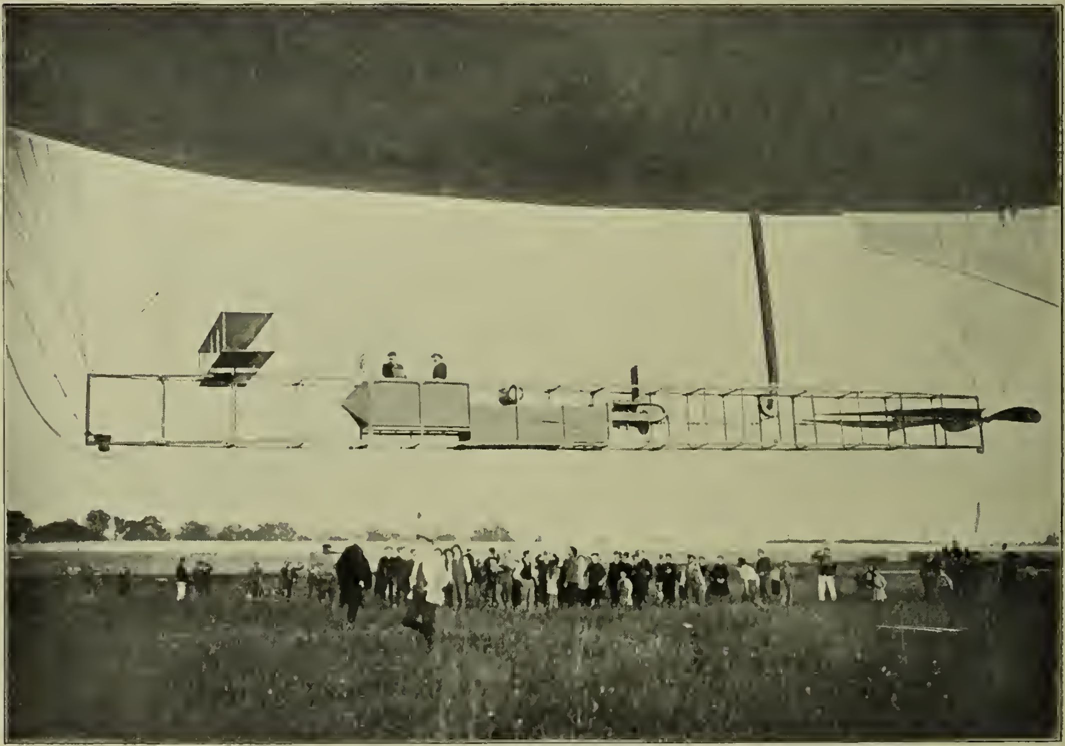
Small electric motors were fitted to a dirigible about 1884 by Renard and Kreb, and several short journeys were accomplished at a low speed ere the electrical power was exhausted. But it was seen that the necessary propulsive energy could not be obtained by stored or secondary force, and later experiments to fit steam engines were also unsuccessful, since the weight of the engines was excessive.

Thus a practicable form of vessel was impossible until a suitable engine was available, and we can pass over the many unsuccessful attempts to produce useful dirigibles ere the petrol motor had been rendered suitable. A period of reaction followed, and the idea was not taken up vigorously again until motor-racing, late in the nineteenth century, had called attention to the rapid improvements which were being effected in the internal combustion engine.

It may be said that no practical success was attainable in any branch of aeronautics, save ballooning, until the petrol motor was developed, and the application of this engine was in many cases made by a new order of experimenters, as the older school of aeronauts was very conservative on the point. Aeronautics had drifted into a mere abstract science, in which worthy men discussed the subject very learnedly from year to year, but accomplished very little of a practical nature. Until the motor engineers brought them a new and marvellous engine, the aeronauts were unable to apply suitable power to their machines, and the problem of flight was generally regarded as impossible.

Several inventors who were experimenting with dirigibles saw the possibility of the internal combustion engine, but years elapsed ere this type of motor was successfully employed on an aerial vessel. One of the most daring experimenters was Santos Dumont, who, about 1899, fitted a petrol engine to a small cigar-shaped balloon, and in 1900 accomplished several remarkable trips. He built quite a number of dirigibles, all of small size, and with these he carried out various daring journeys above Paris which drew the attention of the world to the new mode of locomotion.

Other experimenters followed suit, and


The Car and Rigging of The Zodiac III.

within a brief period many dirigibles were built. It was soon apparent that the designs of most of them were defective, and that a good deal had yet to be done ere practicable ships could be evolved. A series of disasters drew attention to these defects, and it was gradually learned from bitter experience that the problem of aerial navigation was far from being solved.

Whilst most of the experimenters adopted a flexible gas bag from which the car with engine and crew was suspended, another school worked on the idea of making a rigid envelope and fitting within this a series of gas bags. Yet another school sought by various methods to stiffen the usual flexible gas bag, and so three main types of dirigibles were developed. Even the rigid type, however, had been thought of in the eighteenth century, but not until later in the nineteenth century could any practical application be made of the principle.

These classes of dirigibles may be set forth as follows:—

(1) Non-rigid.
(2) Semi-rigid.
(3) Rigid.

Non-rigid Dirigibles.—The non-rigid is the simplest form to construct, as it is merely a balloon of spindle shape from which the car is slung. From its cheapness and simplicity, it came most generally into use, and it is still solely employed by the British military authorities, although it is the least suited for warlike purposes.

Zeppelin II. in full flight over Lake Constance.

There are many obvious disadvantages in a vessel of this type, the most pronounced and incurable being that of slow speed. Now speed is the dominant factor in dirigible building, since an efficient vessel must have a speed higher than the average wind speed if it is to be safely used with any frequency. The ordinary non-rigid dirigible has a still-air speed of 10 to 15 miles an hour, which means that it cannot travel directly against a moderate breeze. As the ship gains in speed, its range of utility increases, and it can with greater safety be employed on days when a slow vessel would have to remain in its shed.

The gas envelope of the non-rigid balloon keeps its shape by the internal pressure of the gas, aided by balloonets through which compressed air is pumped. But this shape is deformed if the vessel is forced through the air at high speed, and this deformation adds considerably to the wind resistance, thereby slowing the ship. There is danger of the envelope buckling, or twisting, or even breaking its back if the wind pressure or the weight of the car is suddenly concentrated too much on any one portion.

The car is slung by cables a considerable distance below the gas envelope, and the propeller or propellers are mounted either beside the car or a little above it. As the propulsive force is thus applied far away from the envelope which meets with most resistance, the arrangement is very unmechanical, and an enormous amount of energy is wasted. Consequently, through the immense loss of power and the great resistance, this type of ship has a low speed, and if abnormally large motors were fitted with the aim of producing higher speeds, it would be found that many new and serious complications would arise. Several improvements have been effected of late years by making the cars almost as long as the gas envelopes, and by suspending them in such a manner that the whole vessel is much more rigidly braced together. This arrangement has permitted of higher speeds being attained.

A Front View of the Zeppelin II.

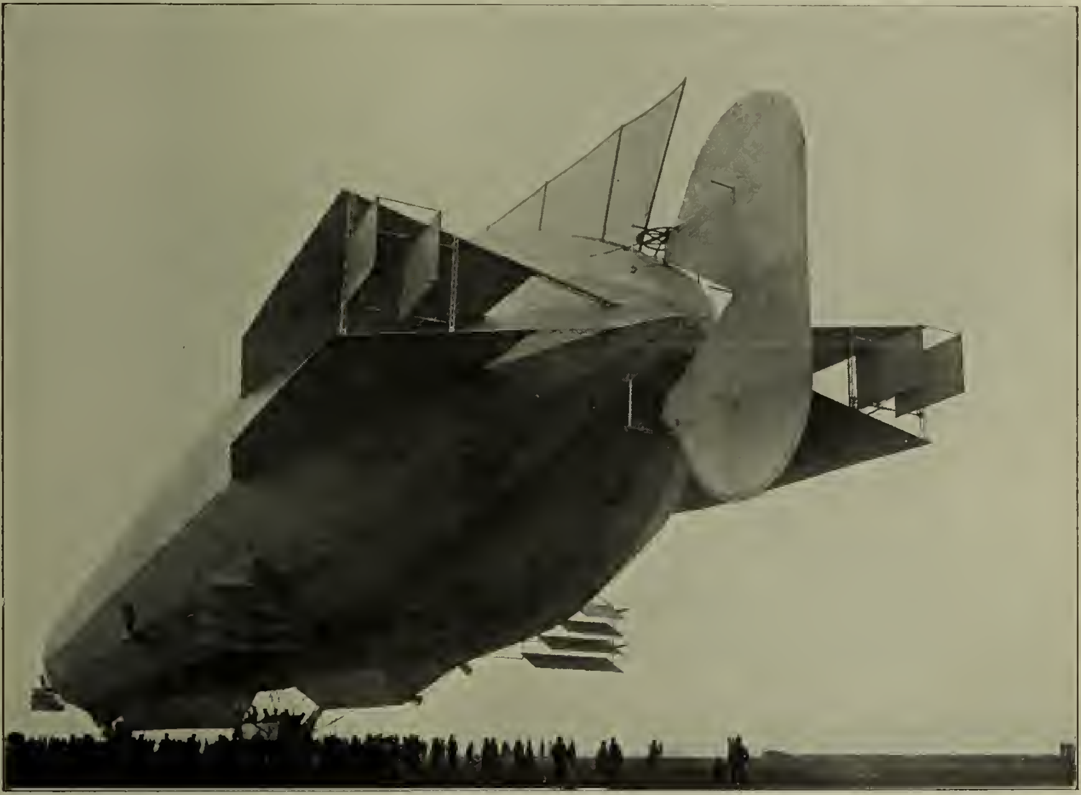
Semi-rigid Dirigibles.—The semi-rigid ship has been designed to prevent, as far as possible, the deformation of the flexible gas envelope. The best-known type is the Lebaudy, which has been adapted for the French military service. Here the gas envelope is given a very pointed prow, and then deepens rather suddenly to its maximum diameter. This deep central portion is borne on a metal framework, which forms a secure base for the whole structure. Underneath the frame is the car, which is kept well up to the frame, thus constituting a much better arrangement than the non-rigid type. Fitted with powerful engines driving two propellers, the latest ships of this type have accomplished speeds up to thirty miles an hour.

In Germany the Gross is the best-known specimen of the semi-rigid, and this is similar to the Lebaudy in many respects, though it is not planned on such graceful lines. The Parseval, the other type of German military vessel, is generally known as a non-rigid, but although the envelope is not supported on a frame, the car has been suspended in a manner which permits of the propulsive power being far more economically applied than ordinarily. The ship is very powerfully engined, and has shown speeds of over 20 miles an hour. But this class of vessel will always be wasteful in power, and high speed will only be attainable by the fitting of such large engines that the carrying and fuel capacity of the vessel will be much reduced. It is probable, too, that further complications will be set up if really high speeds are attempted, which will make the equipment of these ships with very powerful engines undesirable.

Rigid Dirigibles.—We now come to the rigid-envelope dirigible, which marks the most important development in airship construction. Balloons have always been made of very light and flexible material, since these were practically the only substances available which would allow vessels of the usual size to rise in the air, carrying a useful load. The weight of rigid structures would be necessarily heavier than envelopes made of silk or thin fabric.

But several experimenters, as far back as 1871, saw that by increasing the size of the gas envelope it would be possible to use a wooden or even a metal framework; and an early manifestation of this idea was shown by Schwartz, who built an aluminium vessel which had within it a gas bag. Buoyancy was obtained, but a new defect arose in that the vessel, when brought to earth by releasing some of the gas, struck the ground with such force as to be seriously damaged. The outer shell was so fragile that it was able to withstand very little impact with a solid object, and as landing with a balloon is always a delicate operation, the rigid airship was subject to such buffeting that it was open to serious damage.

To cope with this difficulty, Count Zeppelin decided to carry out his experiments with rigid vessels over water, and, by his exploits over Lake Constance, he has brought this type of aerial vessel into prominence. Other workers experimented with wooden frames, and the idea is still believed in by many experts. Indeed, in the present year several ships in which wood is largely used are under construction.



A Back View of the Zeppelin II.

But the Zeppelin ship is the best example of the rigid type, and its gallant inventor has lived through some of the most trying experiences that have ever beset a pioneer. He has had to convince the world of aeronauts that his ideas were not impracticable, and in England at present there are many theorists who still maintain that Zeppelin is working on wrong lines. The best refuta-

THE FRENCH MILITARY DIRIGIBLE "LIBERTÉ.'

tion of this is that the Zeppelin ship has now surpassed all other dirigibles in speed, ascensive power, duration in the air, and length of voyage, and these practical tests should be quite convincing. Nevertheless, much remains to be done ere this type of vessel can be made thoroughly practicable; and owing to its enormous initial cost and the high working expenses, few nations can afford to have vessels of this class.

The Zeppelin ship is made up of a framework of aluminium, very skilfully planned on the girder principle to give great strength with extreme lightness. Over the main girders is a lattice work, and over this is fabric sheeting of rubberised cotton, which entirely covers in the skeleton framework. The main body is over 400 ft. long, and is divided into sixteen or more compartments, each with aluminium partitions. In each compartment is an independent gas bag filled with hydrogen. By this arrangement the outer shell of fabric stretched on its metal frame takes all the wind resistance, and whatever the speed, there is no deformation. The vessel is like a great sixteen-side pencil, long and narrow, with the ends rounded, and thus it can cut through the air with very little resistance.

Close under the main body two cars are placed, each having an engine driving propellers mounted on the sides of the main envelope. Deflecting planes are also mounted on the vessel, and these, by being tilted in the required direction, enable the vessel to be driven upwards or downwards in a slanting manner like an aeroplane. The whole ship is very compact, presents a relatively small surface to the air in front when travelling through it, and thus gets far better results in net driving power from its engine than any of the other deep-sectioned and loosely connected vessels of the non-rigid and semi-rigid type.

From the scientific and the mechanical standpoint, the Zeppelin ship is as much in advance of the other types as the modern high-speed turbine steamer is ahead of the old paddle steamers; but through a curious conservatism the matter will not be admitted by the older schools of aeronauts, and they still continue to urge the most fantastic objections against the Zeppelin. It was pointed out, for instance, by experts that the Zeppelin could not come down safely on land, and this was accomplished to refute them. It was urged that Count Zeppelin could not keep his ship anchored in a high wind; but yet in March and June, 1909, it rode out severe storms when the ship was merely anchored in a meadow. Any other aerial vessel is unable to ride out a storm when at anchorage in the open, owing to the buffeting it receives by reason of its bulky and flabby shape. But the Zeppelin, kept with its nose to the wind, can be handled far more safely.

The design, like that of all other airships, is yet crude, and a serious objection is the high cost of construction, between £25,000 and £50,000. The great length, too, has many disadvantages as regards manœuvring and housing. But, all things considered, the rigid type of ship offers greatest promise of success, for alone of all others it lends itself to high speed.

When an aerial vessel is running at high speed, it is least subject to those disturbing influences which at lower speeds occasion so many difficulties and dangers. The first axiom of safety is high speed, since, unless a ship has a speed well in excess of the normal wind power, it will be hampered by this, and on occasion may be seriously endangered. It may be taken as a general rule that a ship cannot be sent out when the wind is blowing at a speed higher than the average speed of the ship. From this it follows that a vessel with an average speed of ten miles an hour can only safely be sent out when the wind is eight or nine miles an hour. This means that only for a relatively small number of days per annum can such a ship safely leave its shed. The higher the effective speed of the airship, the more frequently can it set forth, and the dirigible with speeds up to forty or fifty miles an hour can be employed on most days of the year.

With the space available it is not possible to give details of all the dirigibles built in recent years, and as they fall into the three main classes already dealt with, this is not necessary for present purposes. Suffice it to say that all the Great Powers of Europe have now tested to some degree aerial vessels with a view to adopting them for naval or military purposes; and in various countries vessels have been built for sport and other purposes. France has led the way with non-rigid and semi-rigid dirigibles, and Germany and Italy have also been successful with vessels of this type. The rigid craft has so far been developed almost entirely in Germany. England has hitherto been content with non-rigid vessels, but the naval authorities are constructing an experimental rigid dirigible.

Uses and Applications of Airships.—Aerial vessels are of such recent origin that they cannot yet be said to have attained a position in which their uses are clearly recognised and their scope well defined. But it would be absurd to assert that they

The French Military Dirigible, "Liberté," in flight.

have neither use nor practical application. Indeed, if they failed completely as commercial or military vessels, they would still have a certain value as instruments of sport and scientific research. But every day more clearly shows that aerial vessels will have a wide range of application ultimately.

The Gross II., Semi-rigid German Military Dirigible in Flight.

At the same time we must not be carried away by the many ridiculous claims put forward for the new locomotion. In the opening section it was shown that there were various factors which rendered aerial navigation difficult, and all these serve to limit its practical utility. It may be opportune now to set forth comparatively the advantages and disadvantages of aerial navigation, assuming a stage of development somewhat in advance of the actual state at present, for in this new science some allowance must be made for future development, or else the remarks made would be vitiated by the time these lines are in print.

Advantages:—

The air offers a new medium absolutely free from obstruction.

Beeline travelling possible over land and sea.

Enormous saving, therefore, in distance and time.

Unique facilities offered for observation work over a wide area, a factor of the greatest importance in warfare.

The most delightful and invigorating form of travel.

Probable availability for high-speed passenger services.

Will help to open up regions where other forms of locomotion are slow and dangerous.

Disadvantages:—

Aerial disturbances more frequent and greater than those on sea or land.

Navigation more liable, therefore, to interruption.

Continuous and punctual services improbable.

Uncertainty, and lack of reliability.

Serious dangers incurred.

Possibility of other and unknown factors further limiting the use of aerial vessels practically.

High initial cost, the small loads carried, and the dangers incurred may prevent a very wide application.

From this general survey of the prevailing conditions it will be seen that at least for a considerable time to come there will be little prospect of the airship being used either for the regular transport of passengers or goods. The uncertainty, the delays, the high cost, and the small loads possible, all militate against such a use. Nevertheless, schemes are in progress both in France and Germany for the establishment of aerial passenger services.

Hitherto the main application has been to military purposes, and probably aerial machines will always be of most use in warfare. If for no other reason than the commanding view afforded by its use, the aerial vessel should be assured of its place in warlike equipment. The art of war is mainly made up of strategy—that is to say, working out surprise movements against an enemy, and it best succeeds in the case where a leader knows accurately the power, disposition, and movements of the enemy, whilst he keeps similar facts about his own force secret.

The airship will permit a general to trace every movement of the enemy hours before the latter can strike, since range of vision increases with altitude, and at a normal height for an aerial vessel the country for forty miles can be examined in every direction. The leader, provided with airships, can thus follow every movement of the enemy, and can make dispositions to checkmate the latter. With tolerably equal forces opposed to him, he should thus have the better chance of securing victory by handling his troops more scientifically.

When both sides adopt airships, a new phase of warfare will be observable, since it will be highly essential to first of all secure aerial supremacy, or else the secrecy of the subsequent operations on land or sea will be interfered with. The fallacious idea is yet held that aerial ships need not be employed by an army, as, if suitable guns are mounted, they can shoot down all such vessels used by an army. This argument might answer in the case of airships coming within range of the enemy's guns; but it is forgotten that for observation purposes an airship, by increasing its altitude, can detect an enemy's movements and yet keep out of range of his fire.

Every important move of a force on land or sea could be detected, and even many night operations could be traced by an airship without this being liable to serious danger from attack, and thus its employment for observation purposes is indispensable. A relatively smaller force aided by such accurate information as airships would afford might with skilful handling be able to check or even defeat a larger body which moved against it, and trusted to the usual methods for gaining intelligence. Indeed, the airships of the smaller force, by locating the advance parties of the enemy, could cause such dispositions to be made that the movements of its own side would be quite screened from the larger force, and this might be led into many traps. Aided by telephone, wireless telegraphy, and other signalling devices, a few airships could keep the whole army in perfect touch with the movements of the opposite side. For naval work also, the airship in its various forms may be employed, but, owing to the high winds which prevail at sea or on the coast, high-speed and reliable aerial vessels will be needed for this service.

A wider field opens out when we consider airships as fighting units. Some form of armament will of necessity be carried, since, in order to break down the observation system of an enemy, the rival force will endeavour to destroy its aerial fleet. War amongst airships must follow as a

The Gross II. during Military Manœuvres at Cologne.

consequence of the vessels being used by both sides; and, as a further development, aerial vessels will be fitted out for making attack on land and sea forces by despatching against them explosive shells and other missiles. Expert opinion is divided on the utility of such operations, many people holding that it is impossible to carry out this form of attack with reasonable accuracy. Undoubtedly there are many serious difficulties. Nevertheless, it seems probable that human ingenuity will overcome the present defects, and due provision must be made for the possibility of aerial vessels carrying out night or early morning attacks on capital cities, railway stations, barracks, magazines, naval bases, fleets at anchor, and even field forces. The moral effect of these attacks from above will be serious, and cannot be overrated, and the fact that they may be feared at any hour of the night from almost any quarter of the compass will have a very unnerving effect on forces which are not properly protected against them. The only adequate defence is by airship, for no other form of watch by land or sea can be quite effective against swift and silent objects travelling in the sky. Like must meet like.

Uses and Applications of Flying Machines.—Matters are yet not sufficiently advanced enough to enable one fully to determine what the future development of the flying machine will be. At present the most practicable type is the double-deck aeroplane, and next to it ranks the monoplane, each of these being of the fabric-covered, fixed plane type, with screw propellers. There are many thinkers who hold that the fabric surface will be replaced by a rigid material, that the screw propeller will be superseded, and that even the fixed planes will be improved upon.

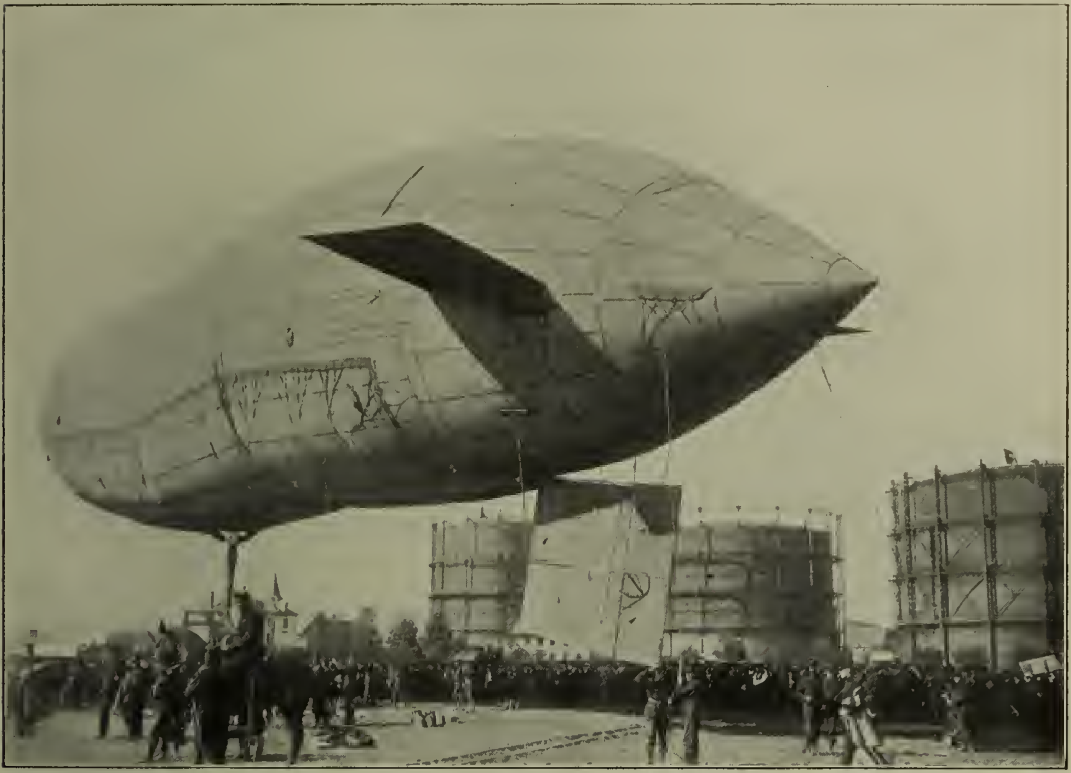
A NON-RIGID DIRIGIBLE, THE "DEUTSCH" AIRSHIP.

It is quite probable that in the material and design the aeroplane will change considerably; but there is little likelihood of the screw propeller and the fixed plane being superseded. There will also be development undoubtedly in the vertical lift machines, the wing-flapping types, and the various combinations of these. Given sufficient engine power, almost all these machines can be made to rise or move through the air; and the process of elimination will bring out which is safest, most useful, and most economical in power.

Flying machines will unquestionably be considerably increased in speed, and to a lesser degree in lifting power. But the task of building really large machines will be fraught with difficulty and danger, as it is not merely a matter of multiplying the dimensions of the smaller machines. In several respects the problem will be a totally new one, and until a good deal of practical experience is gained in the building and employment of small machines, it will hardly be desirable to launch large vessels of the heavier-than-air type.

Flying machines will have many special uses, and for naval and military work they will offer several advantages not possessed by dirigibles. Each will fulfil separate functions, the flying machines being smaller, swifter, more mobile, and thus adapted for use in attendance upon field forces or naval fleets; whilst the dirigibles will be more as auxiliaries to land and sea forces, with, in many cases, an independent range of action, as when carrying out destructive raids.

Future Developments.—As regards the size of dirigibles, the latest Zeppelin measures some 446 ft. in length. The practicable limit will probably be about 500 ft. or 550 ft., and this length might be much reduced with advantage, as the great length increases the cost and the difficulty of manœuvring and housing. The Zeppelin requires greater length than the other dirigibles, owing to her heavier build; and, indeed, for the non-rigids and semi-rigids, it has not been found desirable to exceed 300 ft. in length.



THE PARSEVAL AIRSHIP BEING FILLED AT ZURICH.

With the present dimensions, improved carrying capacity will be attained by better design, more careful choice of materials, and, most important, by improved engines, which, whilst being more powerful, will be lighter and more economical in the consumption of fuel. Improved methods of propulsion will give considerable assistance also, since they will enable lighter engines to be used, and will permit of greater supplies of fuel being carried without increasing the total weight of the ship.

We can summarise the line of development of both flying machine and dirigible in a few words—efficiency and speed. With greater efficiency the vessels of the future will be far more practicable than those at present. The question of speed is of immense importance, since it governs all the other considerations. The safety of the vessel, her power to be used on frequent occasions, and her ability to contend against the sudden aerial disturbances which may arise, will all depend on the speed to be derived from her propellers.

Taking speed as the criterion of safety and efficiency, it would seem that the rigid ship must ultimately prevail as the best type of dirigible, though improved forms of semi-rigids may always find a more limited use, and have advantages by reason of their simplicity and cheapness. For the non-rigid, however, there seems very little hope.

The rigid ship will be best suited for high-powered engines, and will get the best propulsive power from them. She will thus have higher speed and a greater range of action, whilst her margin of safety will be better than that of slower ships. The storage of gas in the buoyancy chambers, the ascensive power, the shape and size of the envelope, the disposition of the mechanism, and countless other problems are only now being investigated, and we may expect many great changes in design ere an established type will be arrived at.

With regard to the relative importance of the dirigible and the aeroplane, many opinions are expressed, and, generally speaking, the advocates of one type can see no advantage whatsoever in the other. It would be more reasonable to take the view that the large dirigible and the smaller flying machine will have different functions, whether used for naval or military purposes, or in sport or commerce.

The dirigible, by its greater carrying power, wider range of travel, and greater ascensional power, will be employed on warlike operations, night journeys, and even destructive raids, whilst the aeroplane will be kept more closely in attendance upon the force it is attached to. Its main occupation in warfare will be observation and despatch work.

In sport, too, the vessels will be employed in different manners. The dirigibles will be more costly, and require more elaborate arrangements, whilst the aeroplane eventu-

A Bayard Clement Airship.

The First Flight of the New Russian Airship, "Russie.'

ally may become a cheap instrument, available to a large number of people, and applicable to many special purposes. This point merits attention, for there is a disposition to treat the various types of aerial vessels as antagonistic, the view being held that flying machines will entirely supersede dirigibles, or *vice versâ*. In the present stage of the science it is far more advisable to consider every practicable type, and develop each as far as possible.

Montagu of Beaulieu.

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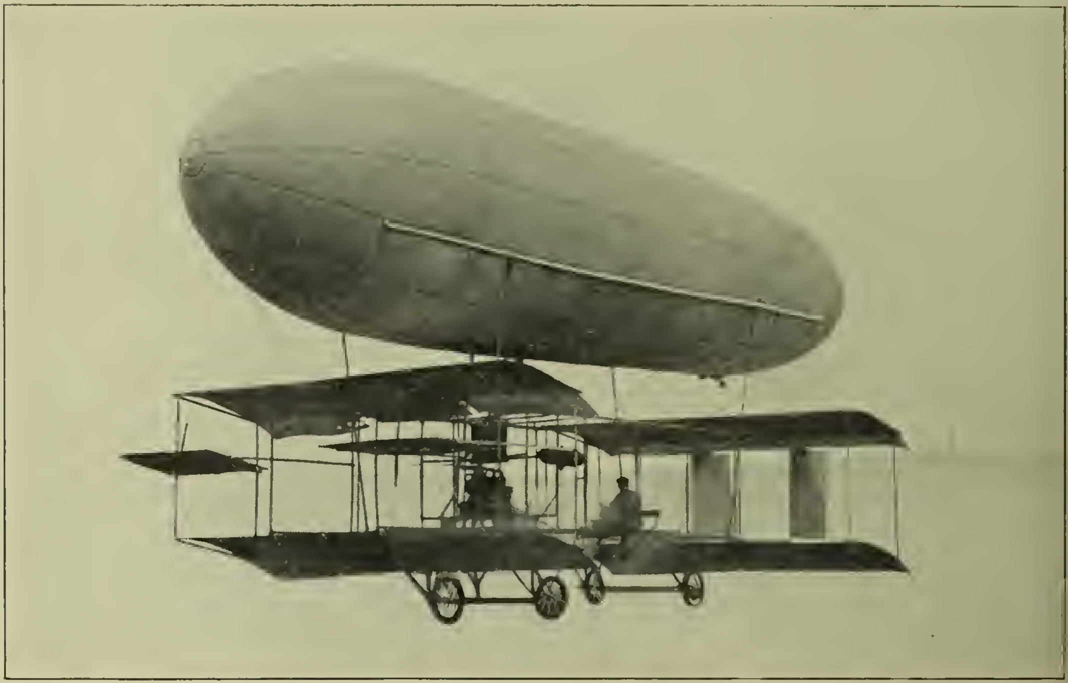


A Combined Gas-Bag and Aeroplane Airship.

M. César's interesting combination of dirigible and biplane. It is fitted with a 50 h.-p. Prissi and Berthard motor, and has been tested in France.

ALLIGATOR.—The alligator seems so likely to be exterminated for the sake of his skin, that any account of shooting him may become ancient history in the comparatively near future. And save for the fact that the pursuit of the saurian takes one far from the tread of man, it cannot be said that the sportsman will have much to regret when *Alligator mississippiensis* is as rare as the wild camel of Spain or the bison. For beyond an ordinary acquaintance with the handling of a rifle, a boat, and the knife, the most enthusiastic alligator hunter cannot claim for his hobby that it exacts much skill, patience, or nerve. As an angler for pike and one who likes the sport, I would say that alligator shooting is a sport of about the same calibre. And more, the alligator himself is by no means dissimilar to *Esox lucius*.

The alligator is to be found in many parts of the new world. He may always be distinguished from the crocodile by the presence of a pit or *sulcus* in the upper jaw, which receives the long teeth of the lower, and by the fact that he has the hind feet webbed to a lesser degree. His habits and methods of capture do not appear to vary. The personal experiences with which I shall deal are such as may at present be enjoyed at almost any time of the year in the rivers, creeks, lagoons, and cypress swamps that pour their waters into or are supplied from the Gulf of Mexico, away down by the Ten Thousand Islands.

The equipment for an alligator shooting expedition is not complex. For a land journey one needs a mule wagon, containing a flat-bottomed folding-boat—any other keelless boat would do—a tent, mosquito nets, cooking utensils, small bore rifle, gun, rods, large gaffs, several bull's-eye lanterns, and some skinning knives and skin preservatives. A day's journey inland from almost any place on that portion of the Gulf Coast described will bring one to a lagoon, or pond, as they are called.

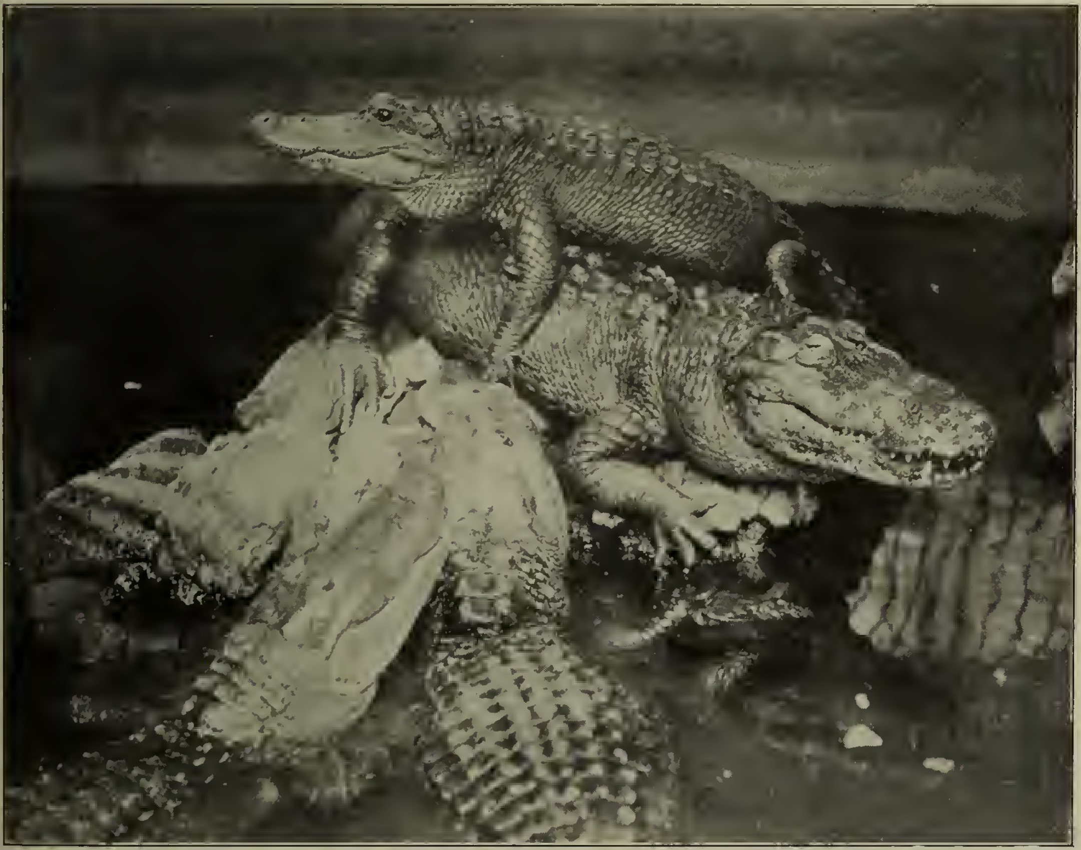
If travelling by boat or canoe, one will speedily be able to tell if one is going in the right direction. Provided an approach is made with comparative silence, the alligator will be found basking in the reeds, or in the mud, or, as often as not, floating with the stream, a portion of his head and his eyes just appearing. At the least sound he disappears in an instant. Like almost every creature of the forest and solitudes, he is quite harmless, unless wounded or aroused. And then one had best beware his sharp, wolf-like fangs and lashing tail.

I can best describe the method of shooting him by an account of a recent expedition. Having spent some days in getting ready our tents, cooking utensils, tinned and other provisions, canoes, rods, cast nets (for live bait), guns, rifles, revolvers, and other impedimenta, we started at dawn from a spot somewhat south of Caximbas Bay, heading direct for the Everglades.

Our little company set out in the chill that precedes the first glimmer of morning. In that region, where either rod or gun may be used every day in the year, we were busy at once. Breakfast had to be caught *en route*, and the simple and clumsy device of a piece of mother-of-pearl attached to an ordinary Jardine snap tackle, and trailed behind our boat in fashion now very properly illegal in the Thames, speedily resulted in what at home would have been considered a fair day's sport—one channel bass, glorious in his golden scales, one sheephead, two bone fish, and many groupers.

At night we came to the shores of one of the best alligator lakes the heart of hunter could desire, pitched our tent a hundred yards from the shore, and after dinner our guides took the canoes to the lagoon and launched them, and we looked to our lanterns and rifles.

Towards eleven, when the great wilderness around us echoed with the myriad noises of a tropical night, when the fireflies were at their brightest, and the shooting stars reached right across the sky, it became time to commence our operations. First, we filled our belts with cartridges, then we armed ourselves with Winchesters and a long iron gaff, and finally we fastened round our palmetto hats a leather band which secured our lanterns.



[*Photo. by W. S. Berridge, F.Z.S.*

ALLIGATOR.

That we should puzzle primitive four-footed creatures and paralyse all manner of fowl was not to be wondered at, for the effect of a number of human beings stalking through such surroundings in the dead of night with great beaming lanterns where their heads ought to be was startling even to the initiated onlooker. It was all new to us then, and we tingled with pleasurable excitement. Twice, as we made our way as noiselessly as possible, we stopped suddenly, involuntarily. Once to make way for something large, heavy, and cumbrous, yet active, that moved from us, and went rustling through the reeds into the distance, till with a splash it tumbled into water: it was an alligator, a big bull alligator. And again, when close by we saw two gleaming opals that came slowly towards us. But crash! on a sudden the deer had recognised its enemy man, and was off and away.

A minute more and we divided and took to the boats. We had already seen the effect of the beam of light on a deer, and we were now to witness something indescribably ghostly. We pushed silently and slowly on to the waters, one party taking the right side of the lake and the other plashing gently in an opposite direction. In the strange silence, broken by the noises of frightened birds and the occasional swirl of some rising fish, moments seemed hours, and at least one of the party thought that the sport would never begin. We had got what I imagined to be a hundred yards or so out into the lagoon when our guide turned slowly inshore, telling me to take up my station in the bow of the canoe. Rifle in hand I knelt. Following the directions of our instructor I flashed my light from side to side. When we got accustomed to the weight of the lantern and the darkness, it became evident that the fringe of the lake was jewelled with small, twinkling, and star-like orbs. "Them's 'gators, sirree."

Presently some of the twinkling lights came nearer, or we travelled nearer to them. "Wait till a pair gets as close as possible and fire between the widest pair you can see."

These were alligators' eyes, and the widest pair would necessarily belong to the biggest Caiman. When the eyes had come quite close, "Crack" I fired.

There was a splashing all about us, and the eyes disappeared. It was an anxious moment, and, as it proved, a disappointing one. For, though our guide tried to console me by the reflection that I had probably hit him in the body (they can carry any amount of metal) instead of between the eyes, I had my doubts. We searched the spot, our guide displaying a good deal of polite and unnecessary zeal, I thought, and in a minute or two resumed operations, for the bright orbs were re-appearing all around us.

My next shot was more successful. Hit clean through the middle of the brain, the quarry convulsively lashed the water with his unpleasantly powerful tail. That night we came back freighted with a great store of skins, and to-day I have about me in many useful shapes abundant testimony to the efficacy of the simple plan of arousing the curiosity of *Alligator mississippiensis* by means of a bull's-eye carried in the hat. This, then, is Alligator shooting *en battue*. One can also, as I did, carry a rifle on fishing excursions and pot any particularly big specimen approachable.

I had read somewhere that at hibernating time the negro loves to catch the alligator, who falls an easy victim, and that the tail is considered a great delicacy by these native epicures. We tasted him, but we were fain to confess to our inability to agree with their estimate of this curious musk-flavoured and fishy meat.

NORTHCLIFFE.

AMBULANCE.—[*See* FIRST AID.]

AMMUNITION.— This subject may, for convenience' sake, be divided into two parts: the first section dealing with the ammunition required for shot guns, whilst the second treats of that used with sporting rifles.

SHOT-GUN AMMUNITION.

Powders.—In treating of ammunition, gunpowder naturally occupies the premier position. Black powder for shot guns, if not indeed already obsolete, probably will soon be entirely superseded by the more modern forms of explosive, except perhaps in very hot climates, and there is therefore no necessity to investigate that particular part of the subject. There are many well-tried smokeless powders on the market for the sportsman to choose from, and fresh ones are constantly being brought to his notice. The earliest form of smokeless powder was designed to occupy, power for power, the same space in the cartridge-case as did black powder.

Nitric acid is the active agent in all smokeless powders at present in use. The principal absorbents are wood pulp, cotton wool, and glycerine. These substances, after treatment with the acid and combination with other ingredients, are so manipulated that the combustion is retarded to such extent as to insure that on explosion the pressure set up in the gun shall not exceed three tons per square inch, or about the pressure given by a full charge of black powder, which was taken as the standard of comparison. If it is desired to use smokeless powders in shot guns exceeding 10-bore, one of the primary types of powder first mentioned, which comprise Schultze, E.C., and Amberite, should be chosen, for the reason that sufficient experience has not as yet been obtained to determine satisfactorily as to the action of the concentrated powders in guns of greater calibre.

Smokeless powder may be kept for any length of time without deterioration in a cool dry place, if the temperature is within from 40° to 60° Fahr. In cold weather better results will be obtained if the cartridges are kept in a warm room for a few hours before use, so as to bring their temperature up to about 60°.

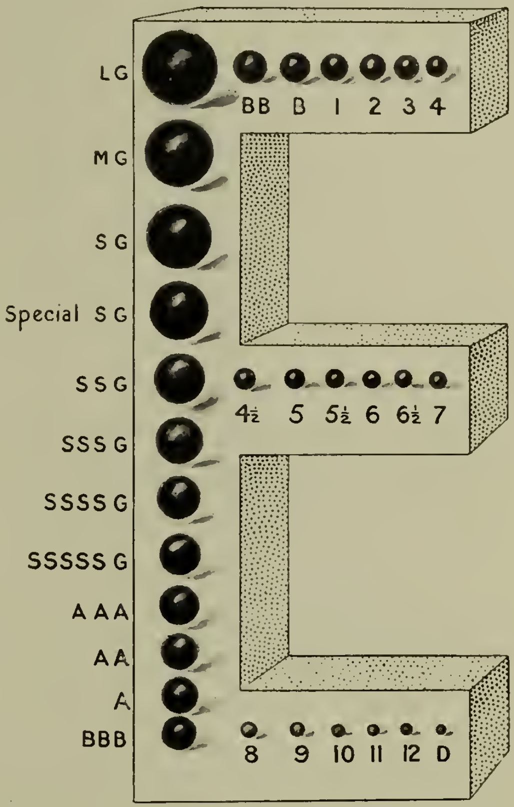
Shot.—The shot in general use varies in size from about 40 to 1,000 pellets to the ounce, as may be seen by reference to the table annexed:

WALKER'S, PARKER & CO.
LONDON.

Size.	No. of pellets per oz.
Mould Shot.	
L G	5½
M G	8½
S G	11
S S G	15
S S S G	17
Drop Shot.	
A A	40
A	50
B B	58
B	75
1	82
2	112
3	135
4	177
5	218
6	270
7	341
8	600
9	984
10	1726

From the foregoing tables it will be gathered that in some sizes the number of pellets to the ounce varies considerably as between the makers, and although the anomaly has often been pointed out, no revision has as yet been effected.

There are two kinds of shot made; "soft," which is composed of nearly pure lead, and the so-called "chilled," which is in reality an alloy, with lead as the principal ingredient. Chilled shot possesses many advantages over the soft kind, for, as its name implies, the pellets are harder, and for this reason they do not lose to so great an extent their spherical form in the cartridge or bore of the gun, and in consequence they keep a more correct line of flight. The pellets are formed by pouring the molten metal through a perforated plate fixed at the top of a high tower. The height of the drop gives time for the naturally formed globules of metal to harden before falling into a tank of water, which is placed in the base of the tower to receive them. The larger sizes of shot are generally used for wild fowl, against the strong feathers and tough bodies of which they are very effective, often at ranges exceeding one hundred yards. The choice of size of shot is usually regulated by the size of the game and the distance at which it is to be killed. No. 6, of 270 pellets to the ounce, is the size most generally used for ordinary purposes of game shooting in England.



ELEY STANDARD AND CHILLED SHOT. ACTUAL SIZES.

Cartridge Cases.—For shot guns these are sometimes made of solid drawn brass; but this more particularly applies to the larger sizes used for wild-fowling purposes. For guns of ordinary size, *i.e.*, 20- to 12-bore inclusive, paper cases are almost universally employed. The principal objection to brass cases is that the sharp edges are liable to cut the fingers of the shooter.

Concentrated powders require a special form of cartridge case, having the interior of the base, that is to say the powder chamber, of a conical shape. These bases vary somewhat in form for the several powders, as also do the cap domes, which have one or more flash-holes of various sizes. The fulminate in the percussion cap is somewhat different in composition and in action from that required to ignite the older type of smokeless powder. A question of vital importance bearing on the action and behaviour of present-day explosives is the inequality of power of the percussion caps, many serious accidents having resulted from this cause. In some instances, owing to the small quantity of fulminate in the cap, the shot charge has been moved only a very short distance up the barrel and the next charge fired has burst the gun. An excess of fulminate in the cap gives rise to high gas pressure in the breech, which is likely to injure the weapon, and in any case irregularities of the sort indicated are a barrier to good and regular work.

Wadding.—In the shot cartridge the wadding is a very important item, as it must fulfil several requirements. It must act as an effectual gas check, not only at the instant of explosion but also while the charge is passing from the cartridge into the bore of the barrel, thus effectually bridging over that part of the bore of the gun termed the "cone."

From numberless experiments it has been found that in a 12-bore a card wad of medium thickness over the powder, next to which is a ⅜ in. soft felt, with a grey cloth under the shot, gives the best results; the wad over the shot should only be sufficiently stout to keep the pellets from shaking loose during transit.

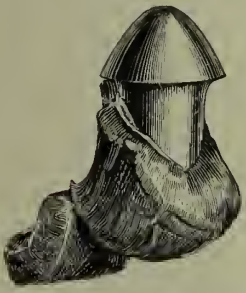
RIFLE AMMUNITION.

Twenty years ago the subject of ammunition for sporting rifles was a very large one. At that period rifles were made by rule of thumb, no two being exactly alike, and as each maker had his own particular charge of powder, shape, and weight of bullet, &c., the varieties of ammunition in use were innumerable. In the event of a bullet mould being lost or injured, only the original maker of the rifle could supply a new one, so that the difficulties under which sportsmen laboured (especially in foreign countries) were considerable. This unsatisfactory state of affairs has for several years past ceased to exist, and rifles are now made to take ammunition of standard sizes.

Powder.—The remarks previously made with respect to the use of black powder in shot guns are applicable for the most part to the employment of this form of explosive in rifled arms, though it is still preferred for large bore rifles and modern ball guns of the "Paradox" type. Indeed, owing to the difficulty of obtaining a good smokeless powder abroad, the care with which it must be transported and kept, and the necessity of using a powder easy to load and invariable in its results, many big game shooters still rely on black powder only. But improvements in the manufacture of smokeless rifle powder make it unlikely that this will always be the case.

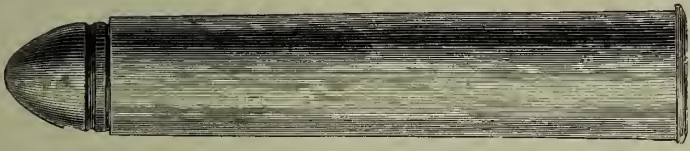
As stated in the previous section, smokeless powders are of two distinct varieties: first, those that, power for power, bulk the same, or nearly the same, as black powder, and, second, those explosives of the concentrated type which occupy a much smaller space in the cartridge case. None of the powders of the former class really deserve the appellation smokeless; and they are all more or less hygroscopic. On the other hand, the majority of the concentrated powders are absolutely smokeless and impervious to damp, whilst the flame emitted from the muzzle of a rifle on firing a charge of one of these powders is scarcely perceptible. Concentrated powders may be divided into two classes; those that are composed almost entirely of nitro-cellulose or gun-cotton, and those that consist of nitro-cellulose combined with nitro-glycerine. Each of these has it own peculiar advantages and disadvantages, which may be briefly summed up as follows:—Those powders containing nitro-glycerine give low and regular gas pressures, and for any given weight of charge the ballistic properties are excellent. The heat of combustion, however, is exceedingly high, and causes severe erosion of the bore, a matter of much importance in the case of a rifle, as the accuracy of shooting rapidly deteriorates in consequence. Powders of the nitro-cellulose class generally give higher and more irregular gas pressures, but the heat of combustion is comparatively low; therefore they do not so quickly destroy the interior of the rifle, and the barrel remains cooler during quick firing. As an example of the last-named class *Rifleite*, and of the former kind *Cordite* may be taken. *Ballistite* holds an intermediate position, as it is principally composed of nitro-cellulose with only a small percentage of nitro-glycerine. Two of the principal advantages accruing from the use of concentrated powders are (1) the great power that can be stored in a small cartridge case, and (2) the considerable reduction in recoil as compared with black powder.

Projectiles.—Almost every sportsman holds a different opinion as to the kind of bullet that should be employed on big game. Some hold that a 4-bore elongated bullet weighing 1,880 grs., propelled by 12 drs. of black powder, is the proper projectile to use. The muzzle velocity of such a bullet is about 1,330 feet per second, and the striking energy at short ranges about 7,000 foot-pounds. Others are in favour of a 4-bore spherical bullet weighing 1,250 grs. This projectile when propelled by 12 drs. of black powder would have a muzzle velocity of about 1,460 feet per second, and a striking energy of nearly 6,000 foot-pounds. Some sportsmen of experience consider that an 8-bore "Paradox" bullet is powerful enough for anything in the way of dangerous game, for at ordinary sporting range it gives such a smashing blow that the animal is killed or turned over at once; a consideration of much importance when an infuriated animal is charging. The 10-bore brass case "Paradox" is almost as powerful as the foregoing, for as it is practically a 9-bore, the projectile used is only slightly inferior in weight and smashing power, whilst the arm itself is considerably lighter. At the trial of an 8-bore "Paradox" ball and shot gun made by the editor of the *Field* some few years ago, six bullets were placed within a space measuring $1\frac{3}{8}$ in. by $2\frac{3}{16}$ in., the range being fifty yards. The charge used was 10 drs. of Curtis and Harvey's No. 6 grain powder and a hardened cylindro-conoidal bullet of 1,150 grains. The weight of this particular gun was 14 lb., and length of barrel 28 in.

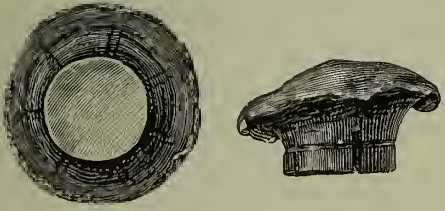


8-Bore Paradox Bullet.
(Steel bullet coated with lead.)
Cut out of an elephant.

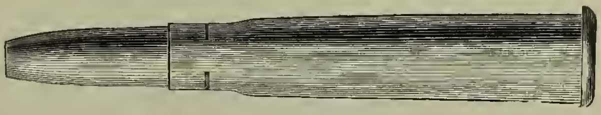
Some sportsmen prefer to have heavy bullets made with a hardened steel point so as to obtain great penetration; others choose a hollow-pointed bullet that will expand on striking, thus expending the whole of its energy in shock. The general consensus of opinion is that an 8-bore, or the No. 10 brass case bullet of the "Paradox" type of weapon, is the most satisfactory projectile to use on dangerous game at any range within one hundred yards.



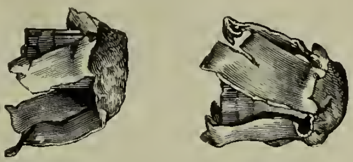
·577 Cartridge.



·577 Bullets. (Cut out of an elephant.)



·303 Sporting Cartridge.



·303 Sporting Bullet. (Cut out of red deer.)

A ·577 bullet weighing 591 grains and propelled by 164 grains of black powder is largely used by those still preferring black powder. It is particularly suited for shooting the largest kinds of African deer, as well as lion, tiger, and giraffe, and even heavier game such as elephant, rhinoceros, buffalo, and other Indian and African large game. The muzzle velocity of this bullet is about 1,660 feet per second, and the striking energy about 3.600 foot-pounds. The smaller ·500 bullet weighs 444 grs., and propelled by 138 grs. of powder it has a muzzle velocity of 1,780 feet per second, and a striking energy of 3,134 foot-pounds. A bullet of this kind is suitable for smaller and less dangerous game than that before mentioned. Both the ·577 and the ·500 bullets are occasionally used with a copper envelope, which, by preventing deformation on striking, adds greatly to their penetrative power. A few years ago the ·450 and the ·400 "express" bullets were in great favour, but they are now being superseded by the ·303 Lee-Metford with a nickel envelope, and the ·256 Mannlicher with a steel envelope. These bullets on account of their extreme velocities possess enormous striking energies. For instance, the ·303 with a muzzle velocity of about 2,000 feet per second, has a striking energy of about 1,907 foot-pounds, although the bullet only weighs 215 grs. The ·256 Mannlicher bullet with a muzzle velocity of 2,456 feet per second has a striking energy of 2,070 foot-pounds with a bullet weighing only 155 grains. When these high-speed bullets are made to expand on striking, they are very effective against deer and other game which do not require a very weighty blow to kill them. Undoubtedly big game have been killed with projectiles of this class, but apart from the consideration of danger to the sportsman, the chief objection to their employment for the work is the fact that an immense amount of wounding must be done when shooting big game with very small bullets. Notwithstanding the high velocities attained by these small-bore projectiles, their shock-giving properties are not such as to insure the immediate collapse of the larger game, unless hit in heart or brain.

The bullets in general use for rook and rabbit shooting are the ·295, ·250, or the ·220, but most sportsmen are of opinion that the ·250 is the smallest bullet that should be used for rabbits.

The following table gives the weights of these bullets with their powder charges:—

WEIGHT OF BULLET.	CHARGE OF POWDER.
·295, hollow-pointed, 80 grs.	10 grs.
·295, solid, 80 grs.	10 ,,
·250, ,, 56 ,, ...	7 ,,
·220, ,, short, 30 grs.	3 ,,
·220, ,, long, 30 ,, ...	4 ,,
·220, ,, extra long, 40 grs.	5 ,,

Cartridge Cases.—For rifles, of whatever bore, these should be of brass and solid drawn. For ball and shot guns of the "Paradox" type it is permissible to use paper cases if thought desirable. The selection and mixing of metals for the metallic cases require the utmost care to insure a high degree of elasticity in the finished cartridge case, so that after it has been expanded by the explosion to fit the chamber of the rifle it will resume its original dimensions, or nearly so. If this important point is not attended to, difficulties will arise with the extraction of the empty cases. When, however, the cases are made of suitable metal, they may be resized and reloaded repeatedly without fear of their jamming in the chamber. The cap-dome in the base of the cartridge case is made to suit the nature of the powder to be used. Some have a large or small central flash-hole, whilst others are provided with two or more flash-holes, which are placed round the apex of the dome. The percussion caps are also made suitable for the different powders. Some powders, such, for instance, as black, merely require a heating flash; whereas smokeless powders, especially those of the concentrated type, require a special cap composition. The question of percussion caps is at the present time a very vexed one, the igniting agent not having received the attention it deserves in face of repeated issues of new or improved powders.

Wadding.—In most cases the wadding made of soft felt and saturated with grease is to be preferred for rifle ammunition, but a greaseproof wad should, in every instance, be interposed between it and the powder. In many kinds of rifle cartridge, the felt wad is dispensed with and a wad formed of a mixture of bees'-wax and tallow, with a thin jute wad to prevent the grease from injuring the powder, is used in its place. No wadding whatever is used with the ·303 Lee-Metford and the ·256 Mannlicher, the bullet being made large enough in diameter to act as its own gas check. [*See also* GUNS, RIFLES, AND SHOOTING.]

H. F. PHILLIPS.

ANGLING.—Definition of the Term.—Although there may be considerable doubt as to the exact origin of the term, "Angling" may be defined as the art of fishing with rod, line, and hook. Even the derivation of the word is a matter of dispute, but whether it be from the Latin, Greek, or Dutch, we may safely assume that the hook is always indicated as indispensable for the catching of fish. One of the recently published dictionaries describes Angling as "fishing with an angle." About this there is a charming vagueness which leaves abundant room for the exercise of private judgment.

History.—In the voluminous and ever-increasing literature of Angling a vast variety of interesting speculation has been compassed as to the history of the art. There are well-known passages in the Old Testament which are quoted as proof that the ancients were accustomed to fish with hook and line, if not with rod; and inscriptions and drawings recovered from unearthed cities leave no doubt that the Greeks, Egyptians, and Romans included Angling amongst their occupations or pastimes. The Egyptians must have brought their practice of the art to considerable perfection, for amongst the wonderful relics excavated from the tombs by Professor Flinders Petrie are well-preserved examples of fish-hooks of admirable shape and make, and in general characteristics not unlike the Limerick pattern beloved by salmon fishers in the present day. Here, again, is suggested food for fancy, and if there is no evidence (as some have alleged there is) that Tubal Cain was the first manufacturer of fish-hooks, and that one of Noah's sons was the first fly-dresser, there is no living person who can authoritatively affirm otherwise. The supporting argument that fish were the only outside animals which survived the flood is, to say the least, ingenious.

The old-world fishing must have been a matter of honest and everyday pot-hunting. It would first become a calling, and then a science. However, early in civilisation Angling was evidently practised as a sport, and there are oft-quoted passages from Oppian that might be, with little alteration, adapted in describing a fight to-day with a big salmon or pike in a British stream.

Older Literature.—The character and progress of Angling amongst the ancients are too much matters of conjecture to justify more than a passing allusion; but we are on firm ground in the period which may be said to be represented by the legendary Dame Juliana Barnes (or Berners), whose treatise was the first published work upon fishing, although it would seem that the earliest known reference to Angling in England is a brief passage in a tract, entitled *Piers Fulham,* supposed to have been written about the year 1420. The *Treatyse of Fysshynge wyth an Angle* goes, however, into particulars, and shows that fishermen of the day were familiar with the use of rod, line, hook, leads, floats, and fishing boats. The Romans undoubtedly knew something about artificial flies, and used them, but it is believed that fly fishing was practised in this country in the fifteenth century, and the aforesaid lady of St. Albans gives a respectable list of the flies to be used in successive fishing months, her season very reasonably beginning with March instead of February, as with us. This list of flies, however, only refers to trout and grayling. In the next century Leonard Mascall published a book on fishing with hook and line, which contains much practical wisdom about fish culture. The angling pictures were taken from Dame Barnes. Early in the seventeenth century an angling poem published by "J. D." (John Dennys) teemed with sound advice and instruction to anglers. In these old books the development of Angling may be traced, and they indicate that the sport was well established amongst the English people. In the same period Gervase Markham issued his *Art of Angling,* which is to a great extent a rendering into prose of "John Dennys, Esq."

Walton.—Walton and his contemporaries may be taken to represent another period, in which the anglers were good all-round sportsmen. More than that, not only Cotton's contribution to the *Compleat Angler,* but Barker's little book, which was published before Walton's immortal classic, furnishes internal evidence of proficiency in the dressing of flies and use of the fly rod. Walton probably took not a little of his information from Barker, who appears to have been the first English writer to mention the use of the winch in fishing. The old woodcut illustrations of this period represent the rod without the winch, but some sort of a reel (or as they used to call it, winder) was not unknown to the few. After Walton there is not, for a while, much in literature to indicate in what degree Angling developed; but an active and cultured English Angling School arose soon after the opening of the nineteenth century, and Salter, Davy, Hofland, and others were amongst its head masters. The revolution brought about by steam and cheap literature gave an impetus to our play, no less than to our work, and Angling advanced with leaps and bounds, foremost amongst the leaders of the more modern period being "Ephemera," Francis Francis, Rooper, Pennell, and many others in England; Stoddart and Stewart in Scotland; Newland and Maxwell in Ireland. Anglers are now a great host; their sport has its periodical Press; a modern community is not complete without its fishing club; and Westwood and Satchell's *Bibliotheca Piscatoria,* which was published in 1883, catalogues over three thousand works more or less concerning fish and fishing.

Fly Fishing.—Although in matters of sport comparisons should never be invidious, by common consent there may be legitimate distinctions. Hence fly fishing is universally regarded as the highest form of angling, and it is a claim which is not advanced without sufficient reason. For example, it appeals most of all to the artistic and imaginative fancy; it demands special knowledge; it requires delicate skill; its exercise is at once costly, and beset with difficulties of an exceptional nature.

On behalf of fly fishing it is further to be said that it is applied to the choicest of our fresh-water fishes, since members of the Salmonidæ, which are, technically speaking, the game fishes of this country, head the catalogue of species which are habitually lured by the artificial fly. These require the purest and best preserved streams for their habitation; sluggish and open waters are not their natural home, though they often do maintain an existence therein. The proper habitat of the game fishes is all that is brightest and best of our rivers and lakes; it is the stream which runs crystal clear and pursues a joyous course that is the ideal home of salmon, trout, and grayling; and not the least of the fascinations which make fly fishing an absorbing pursuit is the association it brings as a matter of course with the most picturesque phases of natural scenery. These are amongst the reasons why fly fishing is always lauded and magnified to an extent not possible with other branches of angling. It is often urged, indeed, with ample justification, that the fly fisher is by his sport brought face to face with sylvan beauties seldom visited by others, and that in his progress in or upon the water, and along its banks, he explores exquisite nooks and corners which even the searching eye of the wandering artist has not the opportunity of discovering.

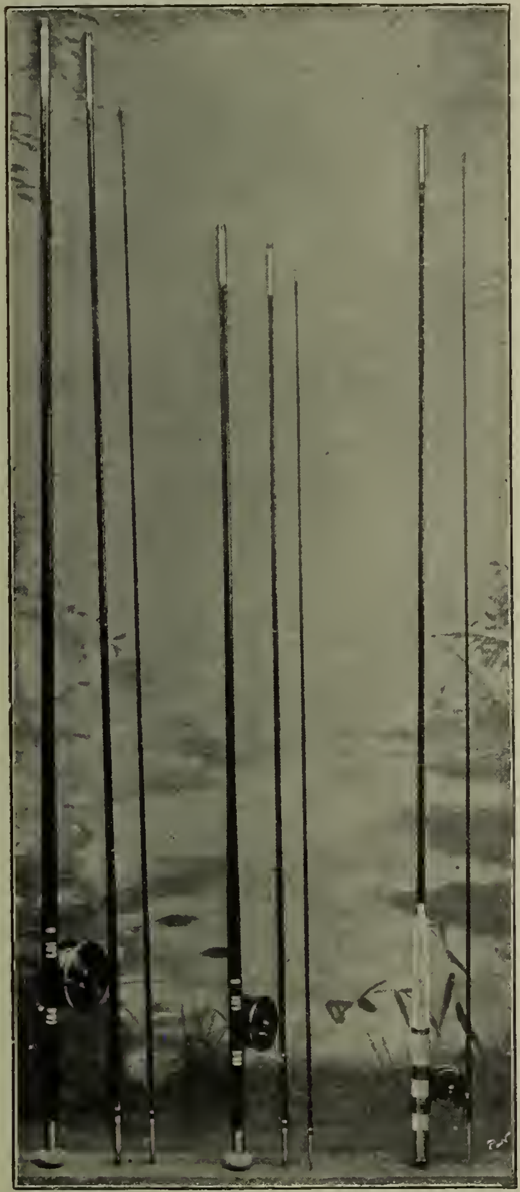
Salmon.—While fly fishing is considered the highest form of the art of angling, it is to be remembered that it is but a section of a general sport, and that it has distinctions within itself offering endless variety of attraction. In glancing at these, the salmon must come first into consideration. With some sportsmen fly fishing means salmon or sea-trout fishing only, just as the word " fish " in Scotland is an exclusive term by which *Salmo salar* alone is honoured. In trout fishing there have of late years grown up definite schools, but the noble sport of salmon fishing does not admit of much divergence from the settled practices of our forefathers; with the exception of developments here and there, not necessarily improvements, in the details of rods, lines, and artificial flies, the general principles of salmon fishing remain what they were fifty or sixty years ago, when there were eminent masters whose wisdom is embalmed in the literature of their day, and whose prowess has never been surpassed.

There are, it is true, other methods than fly fishing for the capture of salmon, and these have in the present day, perhaps, increased rather than diminished. By the fly fisher pure and simple they are viewed with disfavour. But there are excuses to be advanced. It is not always that a salmon will be in the humour to rise to a fly; and there are rivers, of which the Trent, in the Midlands, is the most conspicuous example, where salmon habitually decline to be taken by the artificial fly. They have been tempted with every known composition of fur and feather, yet to no purpose. Even in what are known as the sporting salmon rivers, for which enormous rents are paid, there are pools that are apparently by nature " sulky "; the fish run into them and lie there, and may be caught by spinning baits, prawns, or worms, but as a rule they refuse the fly. Perhaps if salmon fishers would oftener try the experiment of sinking their fly to somewhere near the bottom they might be more successful, but it is not easy to persuade the purist that the wrapping of lead round the body of his Jock Scott or Durham Ranger, or the adoption of any other unusual device for taking the line down to the floor of the pool, consorts with the honourable canons of sport.

The apparatus for salmon fishing and some other methods of angling will be treated of in more detail as they occur in future numbers; at present we are concerned with the general principles, and the mention of such matters as spinning, prawning, and worming for salmon may be dismissed with the remark that they are not in themselves illegal, that they are operations requiring great skill, and that, under certain conditions, they are legitimate practices if conducted in sportsmanlike manner.

Choice of Rod.—The rod is the most important item in the fly fisher's equipment, and he should select one suitable to the size of his hand, the strength of his wrist, and the length of his arm, the inches of his stature, and his physical strength; he should be equally careful to attach to a reel, in balance with the rod, a line that, being neither too heavy nor too light, will work in harmony with both. These are first principles, and it may be added that the line or collar of gut attached to the winch line should be of a substance in proportion to the rest of the tackle as well as suitable to the kind of fishing to be engaged in; and that the artificial fly should be suited to the character of the water upon which it will be cast. These admonitions are the A B C of the game, but it is necessary to put them in plain words, for one often meets brother sportsmen who have fished long enough to have earned the description of experienced, yet who make their recreation a burden and their sport a failure by non-observance of just such primary considerations.

In spite of much written and oral advice, the man himself must be the ultimate judge of the rod that will suit him. The discussions which are conducted as to the relative merits of whole cane, split cane, or greenheart rods, should not persuade the purchaser to overlook the paramount importance of obtaining the thing that pleases, not his ethical notions, but his hand and arm. In the matter of rods we have learned something from American sportsmen; no longer is it insisted, as a hard and fast law admitting of no amending clause, that the salmon-rod must be eighteen or twenty feet in length. The longer the rod, the more power, of course, in the casting of the line, in its recovery from the water, and in the command of a fish when the hook has been driven home. There are, obviously, many advantages which may be claimed for a long salmon rod, but they are too often obtained at the cost of excessive labour. When the angler is either fishing from the bank or wading in the stream, a rod of seventeen feet is, in these progressive days, considered to be adequate for all the purposes of salmon-fishing, and many British sportsmen are adopting the practice of their comrades across the Atlantic, and are content in boat fishing to use a rod of fifteen or sixteen feet; but it is strictly essential that the materials and workmanship should be of super-excellence. A length of line sufficient for all practical purposes can be cast by a rod of this description, and as for the playing of a heavy salmon, if the smaller rod entails upon the captor another ten minutes or quarter of an hour in the struggle, the eager sportsman will not complain of this as a serious hardship. There are well-known salmon rivers where angling is only possible from a boat, and if this is not the most scientific way of catching a salmon with the fly, it is largely practised, with most satisfactory results, and with the knowledge that if the operation of casting becomes in time monotonous, there are compensations in the minimum of tax levied upon physical exertion and mental excitement. The angler, however, whose enthusiasm is most warranted, is he who dons a suit of waders and, with well-spiked brogues, betakes him to the river bed, studying the places where salmon would naturally be found, regulating the length of his cast to suit the situation, and when fortunate, following his fish up or down, fighting him from terra firma. This sort of salmon-fishing offers the chances of many a moving incident on land and water, of perils and obstacles, of the wit of man pitted against the wonderful instinct and pluck of the gamest of fishes; and he is not to be laughed at as rhapsodical who avouches that he would rather hook one salmon in a contest so fought out than half a dozen from the tranquil limitations of a boat. But boat-fishing, like the use of baits other than artificial fly, is at times a necessity.


·Salmon Rod. 14-Ft. Two-handed Rod.* Trout Rod.

The British pessimist is occasionally heard to assert in those very desponding moments when he pretends to think that everything worth having is played out in this weary world, that our salmon-fishing, amongst other great institutions, has gone to the dogs; but, as a matter of fact, in our rivers that are properly preserved and managed, this particular sport, taking one season with another, and considering all circumstances, holds its own with that of any other country. For matters of practical comparison, we have to deal with Norway and Canada. In the early years of the century—when Sir Hyde Parker wrote that he sometimes had so much sport with the salmon as to be indifferent whether he fished any more for a week—sensational bags were made in Scandinavia, but we seldom hear of anything like such wonders in these days. In the rivers that are least harried by the nets, Norway salmon-fishing is still fine in favourable seasons, but the old flavour is gone. In Canada, also, the results are on the whole enough to satisfy an average appetite for sport; but given a typical river like the Highland Dee, where the riparian owners have wisely taken measures to secure a free ascent of fish from the tidal waters, and taking into account the duration of the season with its spring, summer, and autumn

* [The Editors have to thank Mr. C. S. Cummins for assistance in illustrating this article.]

runs of salmon and grilse, there is no better sport in the world, although the size of the fish may leave something to be desired. The legislation for salmon-fishing, which has long ago reached bewildering proportions, has been generally in the interests of the netsmen at the mouth, rather than for the sportsmen in the upper waters. The observer, indeed, who formed an opinion solely from the persistence with which in legislative action the sporting is sacrificed to the commercial interest in the matter of salmon-fishing, would not be much out of order in defending Napoleon's dictum that we are a nation of shopkeepers. The worst drawback to the salmon-fisher in the British Islands is the caprice of the climate, with its alternations or long spells of drought and flood. Over-netting in the tidal waters is also the curse of nearly all the good salmon streams of the United Kingdom, and without early remedy by Act of Parliament even the commercial interests will be ruined by greed. A painfully notorious illustration of a salmon river temporarily ruined for the angler is the Blackwater in Ireland; once the desire of all sportsmen, it is now practically worthless for rod and line. [*See also* SALMON.]

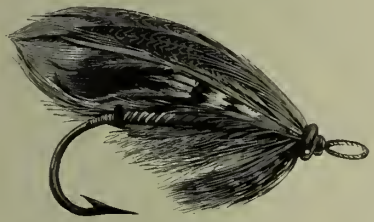
Sea-Trout.—For the main requirements of legal phraseology and official regulations salmon and sea-trout are one; and to the angler the latter is the former in miniature. *Salmo trutta* is angled for in the same way as his bigger relative, but with every item of tackle correspondingly reduced in dimensions. A double-handed rod of fourteen feet, with line, winch, and gut-cast in character, and small flies of bright dressings, present a kind of connecting link between the strong tackle that should be designed to deal with a forty or fifty pound salmon, and the dainty accoutrements of the practitioner who devotes his attentions to the non-migratory Salmonidæ. Sea-trout angling, when the fish are running freely from the sea, and sporting at their best in the streams and pools which they affect as regularly as the seasons revolve, is superlatively delightful; there is no trying labour in handling the rod, and the sea-trout is probably the most sporting of all British fishes in his leaps and bounds, in his undying determination to yield only with his life, and in his bold advances when the right humour is upon him. [*See also* SEA-TROUT.]

Trout.—Fly fishing for fresh-water trout (as *Salmo fario* and his kind are termed as a matter of convenience rather than accuracy, since the migratory fish seek the fresh waters, and the non-migratory often drop down to salt) is the pursuit of the many amongst the educated classes; and amongst them there has of late years grown up or developed what is known as the dry-fly school. The word developed is suggested, for probably so long as men have fished for trout with the artificial fly, it has been used both wet and dry. In the case of salmon-angling, it is not certain in what light a fish regards the artificial fly. Opinions differ, and doctors disagree upon the question, but the popular idea is that it is taken for some creature pursuing its erratic movement in the water. The acceptance of this theory, however, raises the very vexed question of whether salmon are total abstainers from food in fresh water, and its rejection throws upon us the onus of believing that the mighty boil of the fish is merely playfulness, or an angry attack upon an object which has caught its attention and aroused its irritation. In preparing the fly for, and offering it to, the bonny brown trout, however, there is substantial foundation to work upon. With many of the movements of the salmon we are unfamiliar; the dark, swirling, heavy, eddying waters of a typical salmon pool forbid observation of its tenants, except when they condescend to break the surface at uncertain intervals. The representative inland trout stream, on the contrary, should be clear and sparkling, flowing over alternating deeps and shallows; and while the life-history of *Salmo salar* has yet to be written in its entirety and with certainty, we have little if anything to learn of the common trout from beginning to end. He is under our eye from cradle to grave. Although insect food is not by any means his exclusive, or even principal, diet, it is his choicest dish, and his preference for it is probably only limited by the everlasting problem of supply and demand. There are rivers once famous for their good trout-fishing that are losing, or have entirely lost, their reputation. The trout still exist in even larger numbers than in the palmy days of sport, but the insect life has, for reasons which are difficult to define, almost entirely disappeared, and the stream so changed is no more praised as "free rising." With the steady hatch of ephemeridæ a thing of the past, the trout fall into other habits. Though, however, the olive-dun or March brown may float down in single spies instead of battalions, the old instinct remains; the trout will rise to the

LOCH FLY.

fly when his keen eye detects the airy form sailing upon the surface overhead. The angler is therefore able to proceed upon tolerably sure knowledge; he knows that his fly must be presented to the fish on the understanding that it is to be in all essentials a colourable imitation of the insects hatched in that particular water, or the land-born flies that are blown to their doom from the sedges and overhanging bushes. In this respect the trout-fisher is a class to himself. There are purists also here; while there are salmon-fishers who never handled a trout-rod, thinking it beneath their standard and notice, so are there fly-fishers for trout who will have nothing to do with what they deem the rougher and coarser wielding of the big salmon rod, with its heavy line and strong cast.

Eyed Hooks.—Until comparatively recent times, fly-fishing for trout signified the use of a cast of two or three or more winged or hackled flies, to be cast on speculation and allowed to travel down with the stream, more or less submerged. This is what is now classified as wet-fly fishing. It might be imagined, from the prominence given to the contentions and ideas of the new dry-fly school in periodical and permanent angling literature, that all the world is at the present time a dry-fly fisher; yet the dry-fly school, though its members include the most eminent of anglers, is a comparatively limited one in numbers, and its history may be briefly told. A few years ago Mr. H. S. Hall, then, as now, mathematical master at Clifton College, sent a communication to an angling journal advocating the use of artificial flies dressed upon hooks with upturned metal eyes, to which the end of the collar might be knotted, as a preferable plan to the attachment of gut lengths as an essential part of the dressing of the fly. Eyed hooks had undoubtedly been known before in one shape or another, but the universal practice was to tie the fly to a length of gut. The advantages claimed for the eyed hook were: (1) that fewer flies were whipped off in casting; (2) that the liability of the gut attachment at the head of the fly to fray and break was obviated; (3) that the angler could always make certain that the even continuity of his collar or casting line was not marred by the juncture at the critical portion of a strand of gut out of due proportion; (4) that the fly was always ready for use on gut which could be kept in a proper condition to receive it; (5) that a stock of eyed hook flies sufficient for a day or a week might be kept in a box in a single pocket, and preserved in ease and safety from one year to another without danger of treachery from rotten gut. The communication thus published roused a widespread interest, and kindred ideas that had been previously entertained by a few anglers were gradually made known.


SALMON FLY.

FLOATING FLY

Dry-Fly School.—Out of the discussion arose the doctrine of the education of trout. The chalk streams fishers laid special emphasis upon the virtues of the dry-fly as an antidote to the growing difficulty of angling. They insisted that in rivers where the trout used to rise with regularity and confidence, and where sport might be reckoned upon as a tolerable certainty, the fish had become shy, suspicious, and in point of fact educated. The old-fashioned methods of fishing with a cast of artificial flies for such unnatural trout were deprecated as obsolete, and the superior attractions of a single artificial fly, made very small, dressed with upstanding wings, cast with a scientific calculation of direction and force never dreamt of previously—the *sine qua non* being to deliver the imitation fly in the exact presentment of the natural insect, and in a manner that would ensure its floating upon the stream as if it were the real thing—were urged with eloquent enthusiasm. It was in this way that the dry-fly school began to acquire a name of its own; converts were made, and are still giving in adherence; and one of the results has been the evolution of an entirely different character of artificial fly. The dry-fly school of angling is said to include among its members some dogmatists who will scarcely admit the wet-fly brethren to *brevet* rank, but there is room for all and reason on both sides.

In mountain-born waters, like the trout streams of Scotland, Ireland, and Wales, the fascinating old-fashioned style of fishing with a cast of flies rules as if nothing had happened; the rapid rivers must be fished in that way, and the master fly fisher for trout is the man who, regulating his methods to the requirements of the day, the water, and their ever-varying moods, can adapt himself to circumstances as an adept of all styles.

It is one of the leading instructions of the dry-fly master that the disciple shall remain inactive, possessing his soul in patience, and standing by until the trout are seen to be visibly rising at, and taking, the fly sailing down stream. On Itchen, Test, Kennet, and any other typical chalk stream, the angler may accordingly be observed, for hours together, watching for the rise. The wet-fly fisherman, with his cast of assorted winged, hackled, or spider patterns, like his forefathers, arriving at the waterside, comes into action at once, animated by the hope that the trout, if they give no sign of dimpling ring, are busy below, feeding on trifles borne at varying depths in the current. Should they treat his flies with disdain, at least no opportunity has been wasted. The experienced dry-fly fisherman, where the character of the stream does not forbid, stations himself below the fish, kneeling on the bank to lessen the chances of scaring the shy trout; his aim is to cast his single floating-fly three or four inches above the mentally marked position of a rising fish, and to do this accurately at the first cast. Simple as the operation may appear, it can only be done to perfection by the exercise of long experience and extreme skill. The casting of the line so that the floating-fly shall drop at the precise point aimed at and at once assume the position and appearance of the natural insect, and to do this when and where it will secure the attention of, but without alarming, the alert trout below, is one of the triumphant feats of fly fishing. The whisking of the fly through the air by backward and forward wavings of the rod, and the length of line often necessary for reaching a distant fish, keep the angler in healthy exercise if the rise is protracted. The former tax upon the strength may, however, be lessened, though not quite avoided, by the modern practice of anointing the fly with odourless paraffin, or some other unguent, by a touch of the camel's-hair brush on hackles and wings; a couple of flourishes will then suffice for drying the fly.

The wet-fly fisherman, who cares for none of these things, has the privilege, at any rate, of being constantly on the move, always hopeful that at least one of his flies will find a trout; while in the progress of fishing steadily up or down the stream he is able to change his scene with his chances at every hour. The dry-fly fisherman was a South of England product, and was the effect of which the educated trout of the chalk streams was the cause. In other parts of the three kingdoms, the wet-fly fisherman is the rule, but it is a rule the exceptions to which are becoming more and more numerous. [*See* CHAR and TROUT.]

Artificial flies, either for salmon or the smaller game fish, will be treated of hereafter. [*See* SALMON, SEA-TROUT, and FLY DRESSING.]

A general reference to fly fishing does not end with mention of salmon, *Salmo trutta,* and fresh-water trout. The grayling must have passing attention. This is a fish which, with many undoubted sporting qualities and one special virtue, is not always popular with trout fishermen. Yet it is one of the freest of surface-feeders, and has all the qualities of a fly-fisher's pet. Having an adipose fin, the grayling is, like the smelt, classed among the *Salmonidæ,* but in bodily appearance there is no other resemblance. It, however, gives the same kind of sport, with, generally speaking, the same methods in fly fishing; and the special virtue hinted at above is that, when trout fishing ceases at the end of September, the grayling is at its prime, and may be fished for throughout the winter. [*See* GRAYLING.]

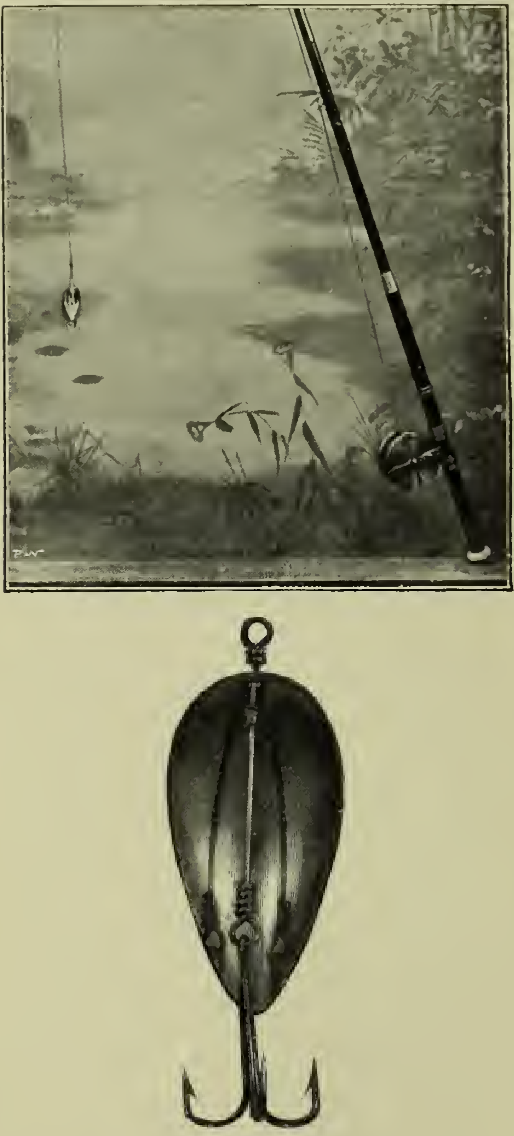
WAITING FOR THE RISE.

Besides grayling there are a few of the summer spawners, such as dace, bleak, rudd, roach, and chub, which, for want of better, are not unworthy the attention of the fly-fisher, the first four with small flies, and the last with large palmers, imitations of moths, bees, and beetles. Only in the hot months, however, is the sport at all worth the trouble of attempting their capture with the tackle intended for higher game.

Spinning and Trolling.—These may be regarded as synonymous terms since, in the country south of the Trent, the second has fallen into disuse. In Scotland and Ireland, when fishing men talk about trolling, they mean the use of the spinning bait, especially as practised from a boat, and in the majority of instances the reference will be merely to the somewhat mechanical process of trailing from the stern. Trolling, however, is a word once of definite signification to English pike-fishers. It was known two centuries ago—was in use, probably, long before what we understand as spinning was in vogue. One of the quaintest of the older angling books is the venerable Nobbes' *Art of Trolling*. Nobbes was a master of the now discredited method. Its main feature was the dead gorge bait, which is now discountenanced by all respectable angling societies and sportsmanlike persons, except when used as a means of warrantable destruction. As the process, therefore, will not be further described, it may here be stated that the bait employed is a dead roach, dace, or gudgeon, through whose body, from mouth to tail, is passed a leaded wire permitting the issue from the caudal fin of a short length of gimp looped at the end for fixture to the reel line. A rank hook, either a double or single, welded into the lead, slightly protrudes from the side of the bait's mouth. The small dead fish thus armed is cast at first close to the bank upon which the angler is standing, allowed to sink head first to the bottom, the angler pulling in short lengths of line in successive coils, working the bait up and down slowly in the water. The silvery fish is thus represented as swimming between and out of weeds, or as darting in spasmodic jerks from the bottom to the top, now sinking and now ascending. It is a deadly method of attracting the marauder lying *perdu* in the subaqueous copses. The pike seizes its prey across the middle of the body, twists it round into its bristling jaws and swallows (or gorges) it head foremost. The art, such as it was, of trolling, afforded wholesome recreation to generations of innocent pike-fishers, who never supposed they were sinning against the light. The secret of it was to ensure the complete gorging of the bait before putting any sort of check upon the line. The pike would sometimes seize the bait with a strong snap, which left the troller in no doubt of the fact, but very frequently the check would be so slight that the unaccustomed hand might suppose the sinking and roving bait was entangled with weed; if he then tightened the line the chances were strong that he would scare his pike. The custom, therefore, was to allow the fish to run unchecked until it stopped of its own accord; this it would presently do in pursuance of its habit of pausing to pouch or gorge. Fishermen used to time this period of expectancy ten minutes by the watch. When the bait was gorged, the gullet of the pike would so tightly encase the bait that the strong, protruding hooks entered its vitals. The victim came in with little fight, and there was no possibility of restoring it to the water after such treatment. Within recent times, as the stock of pike diminished in rivers where they were tolerated for sport, an outcry was raised against the murderous gorge-hook, the principal objection being that under-sized fish were ruthlessly and unnecessarily slaughtered. In many waters, as in the Thames, the use of the gorge hook is therefore prohibited. With this passing description of a method which is now only legitimate in waters where pike are ranked as vermin, and where it is desirable to kill them of all sorts and sizes, we are free to deal with the general subject.

Spinning is the cosmopolitan form of angling. Allowed to rank next to fly fishing as a fine art, it is of wide application, is applied to every description of game fish, is not only popular with the fresh-water angler in Great Britain, but with the sea-fisherman, who thereby with rod and line obtains spirited sport with such fish as bass, pollack, and mackerel, and is practised by the casual angler in all parts of the globe. Wherever predatory fish are to be found, there the angler may remember the adage in whist, and when in doubt play his trump in the shape of some kind of spinning bait. Mahseer in India, the hucho in Bavaria, the monster trout of the Canadian lakes, the prolific salmon of the Pacific, are alike taken by the spinning rod. The method is capable of varied treatment, and has some of the good points which are enumerated for fly fishing; the spinning man, for example, is not condemned to inactivity in a Windsor chair, or on the camp-stool by the waterside, but like the trout or salmon fisher is in healthy bodily movement during his term of sport. Another recommendation to the hardy sportsman is that spinning for pike affords excellent recreation during the winter months, when all coarse fish are in the height of condition. Even when the grayling rise but seldom to the fly, the pike are in keen humour, in prime colour and form, with appetites often sharpened rather than depressed by the hard frosts and howling north-easters, which put an end to other kinds of sport.

Artificial Baits.—The spinning-rod, however, is largely used also for salmon and trout. It is certain that the practice of spinning for salmon has increased during the last quarter of a century; and were all the truth made known, it would be found that many of the bags made upon salmon rivers, and published weekly in the sporting newspapers are made by the blue phantom, or silver and golden minnow. The principle underlying the art of spinning is to attract the fish by the movement through the water of an object that shall imitate, in shape and action, some form of aquatic life. The artificial baits which have been invented to effect this object are legion. They are of metal, gutta-percha, and of soleskin, in the case of the phantom, which is a collapsible object when out of the water, but a plump imitation of trout, gudgeon, or loach when, set in motion by the spinning-rod, it becomes filled with water. Some of the artificial baits, brightly glittering, or artificially coloured, are armed with fans at the head to ensure the spinning, but these permanent outstanding fixtures are not in unison with the tastes of all anglers; to meet their wishes a very effective pattern of artificial fish is produced, the spin of which is effected by a fixed curvature of the tail. Notwithstanding the host of "notions" which have been placed upon the market as registered or patented inventions, there is probably no better all-round artificial spinning-bait for salmon and pike than the spoon, which spins, as the saying goes, like a flash, is without the complications which often render the ingenious patents useless after a few trials, and which, by the colouring of the inner surface (gold, copper, or even red), presents a brilliantly tempting appearance in the water. In the salmon rivers of Norway, in the estuaries on the Pacific coast, there is no more trusted lure than the spoon. For pike fishing also this rough and ready imitation of a darting fish is most effective, and when the pike run large, a spoon of five inches in length is not a whit oversized. It is maintained that the spoon as a bait for predatory fish was first discovered by accident in the United States, and at the Chicago World's Fair what was labelled as the first spoon ever used in angling was exhibited. The rude mother-of-pearl and bone hooks that are used by the South Sea Islanders, and certain devices known to the New Zealand Maories when the white settler first visited them, were the crude originals of the beautifully finished spinning-baits of to-day.



PIKE ROD AND BAR-SPOON.

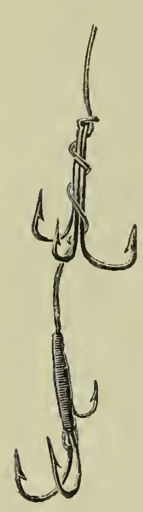
Natural Baits.—The small natural fishes upon which the ravenous pike, prowling perch, and dashing trout of our fresh waters largely subsist are, however, the most reliable baits for general spinning, and for their utilisation there is an ample choice of flights and hooks at the service of the angler. The earlier kinds of spinning flights consisted of two or three sets of strong triangles with perhaps a single hook for insertion in the lip. For salmon or trout such hooks are mounted upon treble or single gut to suit the magnitude of the fish to be caught. The formidable teeth of the pike, and the serrated interior of his gaping mouth, render it necessary, however, to approach him with stronger gear, and the hooks should be fastened to a six-inch length of gimp, or a special adaptation of wire. The two objects which the spinner must primarily keep in view are (1) the employment of swivelled traces and bait fashioned so as to ensure regular spinning, bringing the bait through the water in, as far as possible, a natural course and manner of progression; and (2) regulation of the advancing object at a speed and depth suitable to the habits of the fish and the force, colour, and depth of the water. Spinning, if properly studied, requires intelligent study of the circumstances of the day. In fairly flowing rivers, the current will, in practised hands, like the action of the rod in fly fishing, do much of the work for the angler, while in a lake or dead pool he must rely entirely upon his own dexterity, unless he indulges in the harling or trailing in which the boatmen play a leading part. It must be repeated that the paramount essential is that the bait spins properly. The salmon- or trout-fisher who uses the phantom, spoon, or minnow may reckon upon the encouraging assistance of a lively current, which, in a measure, if he understands how to humour it, will take charge of the bait, and present it in the most perfect manner to the fish over which it travels; when the line is trailed from the stern of a boat a like advantage is ensured by the intelligently-calculated rowing of an experienced boatman. Anglers who have carefully studied the habits of the pike, which is the fish *par excellence* for the spinning-rod, frequently differ in opinion upon one point, viz., is it best that the bait should spin in a straight line, or in a series of jerks and gyrations? In this, as in everything else (notably in wet- and dry-fly fishing), it will be found that the best man in the long run is he who can adapt himself to all conditions. There are times when a pike that will run half-heartedly at the bait which represents a smaller fish moving in a decorously straight track, will rush savagely at the imitation which, by a different fixing of the tackle, is induced to progress in a series of awkward and fantastic evolutions. The theory is that the appearance of a roach swimming at ease was apparently noticed without excitement, while the suggestion that here was a wounded or feeble creature, trying to escape, aroused the sharkish propensities of the wolf of the waters.

The duty devolving upon the angler, anywhere and at all times, is plain: if one method fails, try another. One of the most important considerations, yet one commonly overlooked in spinning, is the weighting of the bait to correspond with the character of the water fished. The latest tackles devised for spinning with natural baits have been brought to a high state of effectiveness; there are endless contrivances for fastening the hooks to the dead fish, and for concealing the weight necessary for sinking it in its own body. This is without question better than leads, detachable or permanent, affixed a foot or so up the trace; with certain tackles, these are, however, necessary, but a double splash is inevitable when the bait is cast forth by the spinning-rod. The bait leaded within itself, on the contrary, may, skilfully treated, be made to fall lightly, with but one disturbance. The detachable lead carries the distinct advantage of enabling the angler to weight his gear to suit the different conditions of water.

Faulty Spinning.—Too many spinning men seem to have an idea, if they ever think at all about the matter, that the fish for which they spin are surface or middle-water feeders, and the result is disastrous. Pike lie low, and spring upwards, as their mood finds them. To-day they will not budge for anything but prey that touches their nose; to-morrow they will leap from the deep out of water in pursuit. Mid-water is the happy mean for spinning, but quite close to the bottom is frequently the depth to which the bait should be regulated. There is no more besetting sin in the spinner, above all in the pike-fisher, than to work above the heads of his game. Another mistake frequently made is as to speed. It stands to reason that a fish must be honestly sharp set, and in the true fighting humour, to dart after prey that is scurrying through the water at express speed. The rapid spinner is like the fly fisher who plucks away the fly in over-eager fashion. The accomplished angler always avoids these two dangers, and will never rest until he learns how to weight his bait to a nicety at will, and to accomplish speed upon common-sense principles.

We have mentioned as fish which are systematically caught by spinning, the salmon, trout, pike, perch, and sundry sport-yielding sea fish, but at odd times chub, carp, grayling, dace, eels, and barbel are deluded by spinning-hooks fairly taken in their mouths. Barbel are so caught principally in the state of restlessness incidental to recovery from the exhaustion of spawning. At these interesting periods they pack together in the rough water, and it is a daily experience during April and May for Thames trouters, spinning from the weir heads, to have their time and temper wasted by struggles with huge, worthless, out-of-season barbel. The taking of spinning-baits by grayling, and by the minor coarse fish, may be included amongst the things that seldom happen. These remarks upon spinning have of necessity involved frequent mention of salmon, trout, and pike, and it may be added that a so-called spinning-fly has been introduced into salmon fishing; the creation is distinguished by a pair of metal fans at the head of an ordinary salmon-fly, and the trace must be swivelled.

Imitations of small birds cast with spinning or salmon-rod for pike, are often successful in shallow waters, in the late summer months, when the fish are basking among the weeds, but it is only by a stretch of imagination that this method can be described as either fly fishing or spinning. It stands as an independent entry in the methods of pike fishing, and with it may here be mentioned the much practised sport of fishing with live bait upon snap-tackle, by which the fish, struck sharply at the run, is hooked in the mouth, and has therefore the opportunity of return to the water if undersized or out of condition. [*See* Pike.]



Live Bait Tackle.
("Jardine Snap.")

Bottom Fishing.—In angling, the greatest happiness for the greatest number is yielded by the humbler phase of the sport which has been, not too happily, designated as bottom fishing. The presumption that the plebeian denizens of the lake, river, and pond feed entirely upon the bottom is but partly warranted. As has been intimated on a previous page, some of the so-called "coarse" fish are surface feeders, and the dace is so much so, that it might almost be considered a link between the game fish proper, and those which are specially treated in the Act of Parliament bearing the name of Mr. Mundella, who took charge of the measure in the year when the Fresh-water Fisheries Act became law. The remarkable increase in the number of anglers has chiefly been amongst the wage-earning classes, who fish in the more primitive methods which may be followed at a minimum of expense and expenditure of time. The schoolboy who is born with the instinct of angling first puts his predilections into practice by a simple wand, a length of string, a painted float, a shotted line, and a cheap hook that is nevertheless all-sufficient for impaling the wriggling worm or pellet of paste, and for swishing out behind him the perch and roach which constitute his juvenile triumphs. The unpoisoned rivers in the vicinity of towns are still well stocked with roach and dace, with barbel, chub, bream, and gudgeon; and in the lakes and ponds there are stores of tench and carp, which are also occasionally found in rivers.

The apparatus used in coarse-fishing is cheaper and more simple than that necessary for the more aristocratic branches of the sport, and that is why, since the diffusion of cheap literature and the facilities for travel established by railways, the artisans of Great Britain have in their tens of thousands become patient disciples of Izaak Walton. All anglers are called Waltonians, but it is doubtful whether the old man knew much about fly fishing or spinning. He, however, was an adept in all-round fishing, and his memorable idyll owes its charms to his love for, and knowledge of, angling for coarse fish. The crowds of men and youths who go out of London every Sunday for the Thames or Lea, or from the large provincial towns to the rivers which flow near their homes, may not have read their Izaak Walton, but in the main they follow the directions which he laid down, and which have been adopted from generation to generation with very little alteration. To those who never personally angled for roach in the Thames or Trent, or for bream in the slow-running Midland rivers, the recreation, with its modest appliances, may seem ridiculously simple, yet in its degree there is as much skill required for success with these essentially shy species as with those which have been previously considered.

Rods and Lines.—The most general form of bottom-fishing is for roach and dace. These gregarious fish shift their ground in search of food, cruising wide in summer, and retiring to the deeps as the weeds which supply them with food disappear before autumn floods and winter frosts. Their established haunts are the angler's "swims," and by the aid of ground-bait the fish may, when they intermittently rove, be soon attracted back. All fish are easily frightened by disturbance or unaccustomed objects on the bank, but the roach is pre-eminently shy, and to be an adept in catching it demands long experience and infinite patience. There are also schools of bottom-fishermen, and they are in the nature of old foundations. Thames, Trent, and Lea have their own curriculum. The bank-fisher's stock begins with a hollow bamboo rod of eighteen or twenty feet in length, without rings or winch fastenings. There being no reel, a running line is dispensed with. The line for this rod should be fine, and shorter than the rod, for the fish bites gingerly, and the strike should be instantaneous; this is only possible with a rod that is comparatively stiff, even to the point, and length of line sufficient to permit of angling with the rod held horizontally over the water. Sometimes the roach bites boldly, and the quill float disappearing sharply, a turn of the angler's wrist and a quick uplifting of the point hooks the stricken fish; with such a rod, landing is effected by unshipping the butt and reducing the length.

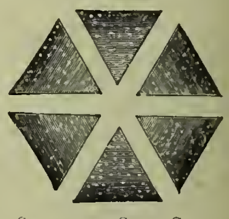
PIKE ROD. ROACH POLE. PUNT ROD.

Until comparatively recent times all the foot-lines were of horsehair, and many modern roach-fishers use them. To the human eyes, horsehair looks much coarser than the fine drawn gut which has extensively superseded it, but as it keeps free of globules of water, and does not glitter, it is probably least obtrusive to the eye of the fish. Mention has been made of ground-bait, and although it is indispensable, in excess it is destructive of chances. Most professional fishermen indulge profusely in masses of moistened bran, bread, and clay pounded together. The object of ground-bait is to attract and not surfeit, and no more is required in the ordinary forms of bottom-fishing than a few balls so kneaded that the lighter constituents slowly flake off when the bulk has found resting place; small pellets thrown in at intervals are enough to keep the fish, once gathered to the spot, in the swim. Coarse fish, like the bream, may have more liberal treatment, and bushels of grains are often cast forth over night to bring together a herd of fish for the angler at the earliest dawn of day. The favourite ground-bait for barbel, which has habits and haunts of its own, are large dew worms, whole or chopped, and chandlers' greaves.

Float Fishing.—The methods of bottom fishing are—float-tackle, legering, and paternostering; and of these, the first affords the popular summer pastime on the river, with legering as the *tour de force* for barbel. The merits of float-fishing are apparent when the weedy bottom of a river is confronted, but when the bed is of gravel, hard sand, or clay, the leger will answer for almost any kind of coarse fish, and it is a method that suits the idle fisherman, who, having cast out his lead, through which the foot line is allowed to pass freely, waits until the "knock knock" at the rod-top signals a fish attempting the bait. In fishing a roach swim, the bait, shotted to trip over the bottom, is always travelling, to be withdrawn for re-travel as it reaches the end of the swim. The float drifts down its allotted course, necessitating no more exertion for the angler than its repeated withdrawal. It is, in summer time, a delightful form of angling. The different ways in which these plebeians of the coarse-fish streams bite give zest to the sport. The roach nibbles so tenderly that, to an ordinary eye, the float is not disturbed, but the Thames or Lea expert will have noticed the faint movement, and, striking at the right time, secured his prize. The dace pulls down the tell-tale with decision; the little gudgeon does the same; the wary carp (when it can be induced to feed at all) is also a bold customer. The perch, beloved of youngsters for his dashing, fearless habits, also leaves no doubt as to his proceedings under water. The tench, one of the least common of the coarse fishes, trifles with the bait before taking it, with leisurely movement. The bream is also a slow biter; and the fish has a habit of playing with the bait for several minutes before the final seizure. The float meanwhile will be bobbing and slanting, and even lying flat on the water, a position caused by the fish rising with the bait in its mouth. Nor is it always safe to strike at this abnormal movement. It is much better to wait a moment or two, when the horizontal position will be gradually changed; the quill will slant off to the perpendicular, and then quickly disappear for final conclusions. The gamest of coarse fishes is the strongly-built barbel. Fishing "fine and far off," is a golden maxim for bottom-fishers, and one of the verities is a thorough acquaintance with the bed of the river. The plummet is the means to this end, and the practised angler would as soon think of going out without this useful article as without his hook.

Nottingham Method.—The two high schools of bottom fishers, Thames and Trent, were once sharply defined, but they have learnt to adopt each other's styles. The principle of the Nottingham men was the travelling tackle, or "long corking"; in other words bottom fishing at a long distance from the angler's base. The special tackle for this is a long and supple rod, upright rings, a Nottingham reel without check or complications, the finest undressed silk lines, and quill or cork float. The angler, by this method, keeps absolutely out of sight of the fish. The Nottingham system of casting is flattered by imitations, and has become fashionable in salmon, trout, and pike fishing. It is difficult to master; everything is done from the free running winch, and the difficulty is so to regulate the reel that there shall be no overrunning. The angler in preparing to cast, winds in his baited line until less than a yard length is left hanging from the top ring. He turns partly away from the water to effect the necessary swing over his left shoulder, and the skilful practitioner, bringing his shotted line round with a nicely adjudged swing, casts an incredible distance. This is one of the approved methods of casting the phantom, or angel minnow for salmon or trout. With the Nottingham style, the coiling of the line on the grass, in the hand, or on the bottom of a boat, as with other methods, is avoided; and the fisherman is able to work without danger or confusion when there are obstacles behind or around him on the margin of the stream.

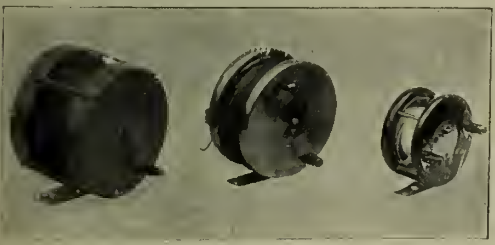
The Angler's Equipment.—To describe in full the paraphernalia which furnish an angler's equipment, would be impossible and profitless. Without any extra encouragement, he is prone to overburden himself with non-essentials. Whatever branch of the sport he favours, he at least cannot do without his rod. There was a time when the ingenious makers of the United States were able, without deadly sin, to boast that we of the old country were centuries behind. Fishing so often as they do from boats in vast waters where there are no obstacles to the play of a fish, they were able to reduce the length of their rods and the corresponding tackle to the smallest proportions. Their special pre-eminence was in split cane rods, generally of six sections of selected cane glued together. We have overtaken them, and have for years produced rods that are not to be surpassed. The split cane rods, in spite of their costliness, are highly appreciated, and English patterns are now exported to the Colonies, the Continent and America. Many salmon-fishers nevertheless remain faithful to the stouter, heavier, and cheaper, but not less serviceable, greenheart. It is the same with trout- as with salmon-rods in this respect. The selection, as has already been suggested, is a matter to be decided by the angler himself; the neophyte, of course, will take the counsel of a competent adviser; ornamental fittings are no harm if they are no good, and there is no law against buying a rod because it is the latest pattern. But the real desideratum is a weapon that can be handled without discomfort. The middle course lies between the extremes of stiffness and suppleness. With respect to a stiff fly-rod there are almost as many pros as cons. It is true that with a stiff rod the cast may be better delivered, the fly more decisively taken from the water, and a maximum of power obtained in a rough adverse wind, but flies are oftener whipped off, and the physical strength is more severely taxed. The springy rod is not so easily managed, but practice makes perfect; and when the taste has been acquired, as with the devotees of Castle Connell, it lasts for a lifetime. Another consideration in the choice of a fly rod is, ferrule *v.* splice. The advocates of the splice declare that the rod can be put together as quickly as the ferruled, but this is theory and not practical experience with the majority. There is no question that a well-spliced rod offers a harmony of play from butt to point which cannot possibly be obtained with the ferruled; but the balance of argument is on the side of the ferrule, especially in these days when automatic fastenings have been invented, removing the objection often heard to the inconvenience of tying the joints together.



Section of Split Cane.

Rod Woods.—Although a number of new woods are continually tried for the manufacture of rods, the familiar materials are still the best. Greenheart is the timber most largely imported for rod making. The tree grows in British Guiana, and none but picked selections should be worked up by the rod-makers. Lancewood, of which the top joints were formerly made, being less heavy than greenheart, has gone a little out of fashion, except for the cheaper sort of trout-rod. The hickory used for the common rods turned out by the wholesale firms is the American variety. Ash was once an indispensable butt for all kinds of fishing rods, and when the wood is well seasoned may always be depended upon. Washaba, mahoe, snakewood, and, most recently of all, another West Indian timber, called steelwood, enter into the composition of trout-rods, but do not oust the greenheart. The canes, however, have apparently come to stay, and the whole, or hollow, bamboo or cane, as it is termed in contradistinction to the solid split cane, is now much used for salmon- and trout-rods. The bamboo rods are very light and remarkably strong, but they are apt to weaken at the ferrule. Canes are mostly shipped from India.

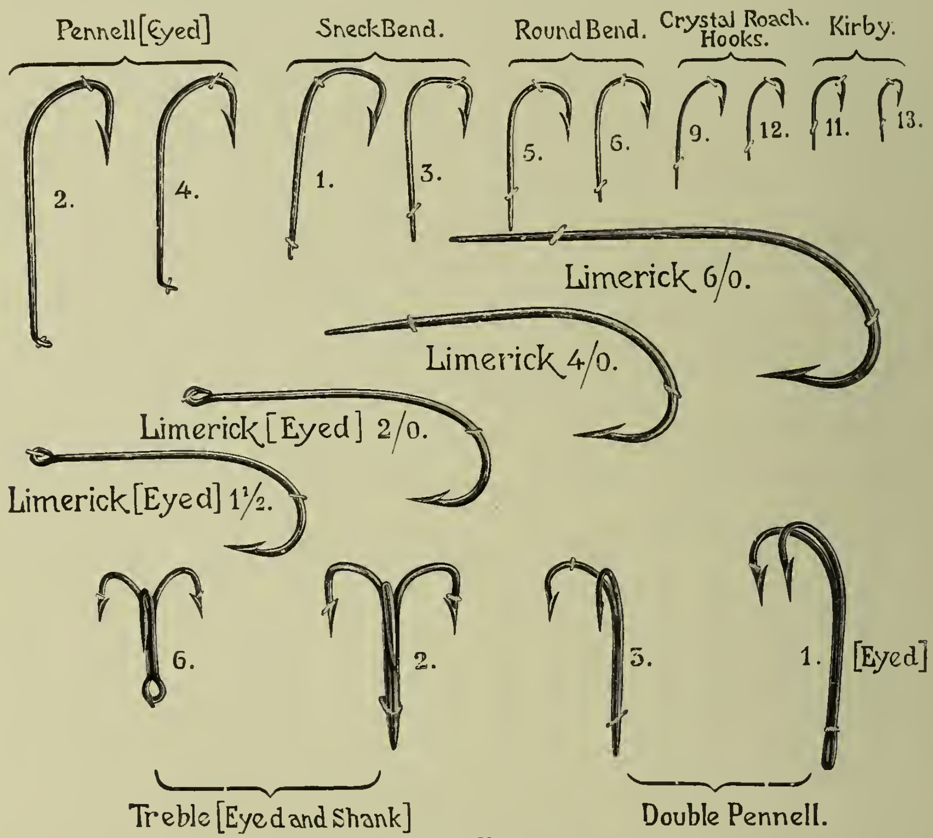
Winches.—Next to the rod is the winch; and this mechanism, much more than any other part of the angler's equipment, has monopolised the ingenuity of the patentee. In America, especially, the reel is an affair of complicated and delicate works, very beautiful to look at, delightful to use, so long as its intricate parts act smoothly as per design. But in angling it is a wise maxim that the simplest is the best, and that all inventions should be avoided which increase the risks of disaster when the angler is at the waterside far from means of repairing mechanical break-downs. These exquisite novelties will never lack customers; but most men, having given the patented and registered reels a trial, are content to return to the well-made hard-metal winches, with their serviceable check. The multiplying arrangement of the last generation has been discarded, and the tendency of the moment is towards the winches which are a compromise between the check pure and simple, and the absolutely unchecked Nottingham reel. The salmon-winch, for example, that will be required in a strong water where the fish run large, and where the stoutest of salmon-gut is necessary, will need a strong check action that will tell upon a running salmon without application of the hand to the line. When the streams are shrunken and clear, and the size of the fly has to be reduced to sea-trout size, with a corresponding change from the stoutest to medium gut, the check should be less obdurate. To meet these divers conditions, reels have been furnished with the means of regulating the revolutions of the free runners. The most recent of these is a clever invention whereby the angler, by putting his thumb upon the rim, can reduce the speed of the wheel almost to stoppage point. Reels are made of bronze, brass, gun- and other metals; of wood with light metal protections, and of ebonite. The reel should be, above all things, of the best quality, for it is the gear upon which dependence is direct in critical times. Rod, line, and fish are each and all in danger with an inferior winch.


NOTTINGHAM PAST AND PRESENT.

Lines.—In lines, again, the whims and fancies of anglers are encouraged by the makers; the main considerations—after the matter of strength—are the weight of the line as adapted to the rod, and the best of dressings. For casting there was nothing better than the silk and hair formerly used by fly-fishers, but they were liable to hold the wet, to perish prematurely, and to play unpleasant tricks when least expected. Dressed silk lines are in these days thoroughly prepared by scientific methods. It is questionable whether a tapered line is, in the long run, preferable in salmon fishing to one of even substance. A salmon-line should be about 120 yards long, though it is seldom during a lifetime that 100 yards

TAPERED LINE.

will not suffice. There is an element of excitement, no doubt, in the narrative one occasionally reads of a gallant fish taking 100 yards of line out at a gallop, but, with proper handling of the rod, such an occurrence seldom happens. A cast of 30 yards is a fair distance for the salmon-rod and generally ample for fishing purposes. A trout-line of 50 yards is more than sufficient for the day, as not half the quantity will be in use for ordinary fish. Such lines are now made for dry-fly fishing, tapered at both ends, and heavy in the middle to fit the temper of split cane rods.



Scale of Hooks.

Hooks.—The bulk of the fish hooks used in the world are made in England—Redditch and Kendal being the centres of manufacture. They are exported by millions. The preference of the moment is for the Pennell-Limerick in salmon, and a Pennell-Sneck pattern for the superior class of small trout flies. The sizes vary from the huge salmon-fly affected in the spring and at other periods for heavy waters, and the tiny midge iron, known as 000 or No. 17, according to the custom of the manufacturer. The latter is probably as near an approach to the invisible hook as can be reached with safety; and as they are often required to land trout of two and three pounds, the temper of the steel must be beyond suspicion. Individual fancy, here, as in other necessaries for a fisherman's outfit, will rule the choice of hooks, to which experts like Mr. Cholmondeley-Pennell have devoted the study of a life-time. Upon the question of hooks, however, anglers are apt to be particularly faddy.

Various.—The fly-fisher, besides his rod, line, and winch, his fly-book or his box, requires a net or gaff, a basket or bag, and a set of waders. These are the essentials of his equipment, but the catalogue may be extended *ad lib.* for those who require their spring balance weighing-machine, vaseline, "priest," gag, disgorger, knee-protector, clearing ring, and small bottle of odourless paraffin for the anointment of the cock-winged flies. In case of accidents by the waterside, a little spare silk, scissors, pliers, and wax, are really useful, but the angler's equipment, when overdone, increases his burden without adding to his efficiency. Many anglers are naturally expert in the making and repairing of tackle; others are naturally clumsy with their fingers and never succeed in even the rudimentary mechanical achievements. The incapables, however, need not distress themselves, since everything that is necessary, and with heaps to spare, can be purchased from the tackle makers.

Care of Tackle.—There are certain operations, nevertheless, which the angler should try to master; he need not enter into a course of instruction in the mysteries of fly-dressing, but he should be able to whip a hook to a trace, or patch up a broken rod top. And, next to the acquisition of sound simple tackle comes the duty of taking methodical care of it, both when in use and when in inaction. The line should always be taken off the reel to dry at the end of a day's fishing; the ferruled joints should be kept vaselined; and every bit of varnish that is accidentally knocked off should be replaced; flies should be kept in an atmosphere of albo-carbon, or other preservative, to keep out moths; hooks deposited where rust will not corrupt, and gut casts excluded from light and moisture. Precautions like these mean money saved, and efficiency promoted.

Modern Creel.

Seasons and Regulations.—By the law of the land, rod-fishing for salmon begins in England and Wales on February 1st and ends on November 2nd; in Scotland, the season is from February 10th to November 1st; in Ireland, the dates vary according to districts, but the close time for netting must never be less than 168 days. The general trout season begins with February and ends with September, but at present in Scotland there is no fence-time for trout. The duration of the close-seasons for salmon is often fixed by the local Boards of Conservators under powers given them by the Salmon Fisheries Act, and the legal limits are only enforced where the rivers are not under local governance. Accordingly, salmon-fishing in Scotland practically extends from January 10th in the north to the end of November in the south, but these are the extreme exceptions affecting a small proportion of the streams. All private trout fisheries in England are allowed to fix their own close times, and they vary considerably in different districts. Trout are not in condition before March in any river, and in the choicest streams the opening day is in April or May. The last day of September is the invariable limit of the season. Salmon licences are required in England, Wales, and Ireland, but not in Scotland.

By the Act for the Protection of Fresh-water Fish (Mundella's), passed in 1878, a close season is established in public waters from March 15th to June 15th for all kinds of fish other than the migratory species. The middle of June is, however, too early for the coarse fish which spawn in March, April, and May, and the pike and roach have not recovered their condition until July at the earliest. The Lea Conservators, indeed, do not allow angling for pike and perch till August 1st, nor for other coarse fish until July 1st.

Minimum Sizes.—The limits of size for fish caught in angling vary, according to the quality of the streams, and the standard decided upon by societies or individuals. In rivers where the trout rarely run large, the minimum length is often eight or nine inches. The maximum figure is upon the Thames, the trout of which are a special and most gallant variety; and here the limit fixed by bye-law is sixteen inches, representing a trout, in good condition, of about two pounds. A twelve-inch limit for trout and a ten-inch for grayling are generally considered a sportsmanlike standard. The average scale of the fishing clubs for other species are—Pike, 18 in.; perch, 8 in.; chub, carp, and bream, 10 in.; rudd and dace, 6 in.; tench, 8 in.; barbel, 13 in.; gudgeon, 4 in.; roach, 7 in.; bleak, 4 in.; pope, 4 in.

Literature.—There is no English sport so rich in literature as angling, and it is of all qualities—theoretical and practical; idyllic and didactic; ranging over the entire watery world, domineering over whale and minnow with equal zest, and abounding with directions, occasionally, perchance, contradictory, and impracticable, as to how to capture the fishes of sea and river. The magnitude of the angler's bookshelves has been indicated on a previous page, in the reference to Westwood and Satchell's *Bibliotheca Piscatoria*, a monument of painstaking research, careful compilation, and remarkable accuracy. In the thirteen years which have intervened since its issue by authors since deceased, many practical fishing books have been published, and it only remains in this article to specify the useful works by which the angler, in search of information to assist him in his sport, will be faithfully served. The poetry and lighter literature of angling we may leave for the reader's own discovery. It is not to be supposed that those processes of angling in its various branches, which have been briefly outlined in the foregoing pages, can be wholly learned from books, but the written page is a superstructure upon which experience will rise more rapidly and surely than would otherwise be the case. A recommended selection is appended to the close of the article.

William Senior.

COARSE FISH.—So far as the so-called "coarse fish" are concerned, the art of angling has perhaps reached its highest level among those who frequent the lovely reaches of the Thames. Much persecution has rendered the fish of our premier river shy to a degree, and Thames anglers, being put on their mettle, now practise almost every known method of fishing with rod and line, and display an amount of skill which is not excelled on any river in the kingdom. To be a thorough Thames angler is to be one who can catch fish in almost any part of the world, though certain foreigners, such as the mahseer and tarpon, of course require different tackle from that used in English streams.

Anyone who can successfully play a large Thames trout on quite fine tackle in a seething weirpool will have no difficulty whatever in capturing salmon on the stouter gut which is commonly used for the king of British fishes; and even the art of dry-fly fishing may be acquired by practising on the dace which, in, alas! far fewer numbers than formerly, frequent the shallows of the lower portion of the river. The peculiar method of fishing followed by the anglers of the Trent—viz., of sending float-tackle a considerable distance down stream by running a fine silk line off the reel, is much practised on the Thames, and, as we have already said, there are no methods of fishing of any account which are unknown to the more successful among Thames fishermen.

Trout and **Pike** fishing will be found dealt with under separate headings, so we may well begin here with a description of Barbel fishing. Without having the dash and vigour of a trout, the **Barbel** (*Barbus vulgaris*) ranks among the strongest of fresh-water fish. Being caught commonly in places where the stream runs strongly, and, unless the water be thick, requiring fairly fine tackle in his capture, he gives more sport than perhaps any other fish in the Thames, the trout excepted. He spawns in the spring, and for a while afterwards, develops a most remarkable appetite, often taking the spinning bait of the trout fisher in the weirpools. However, by the time the angling season opens, which is about June 16th, he begins to feed on worms and other baits. Greaves, called "scratchings" on the Trent, gentles, and cheese, will all account for a barbel occasionally, and these fish are very fond of the caddis at the commencement of the season. They sometimes take a lampern in the autumn. But of all baits the worm stands first, and, perhaps, greaves come second.

[*Photo. by W. B. and S. C. Johnson.*

Barbel.

When the water is very low and clear and the fish seem almost unapproachable, clever anglers occasionally make moderate captures of barbel by using a fine line and a small hook baited with gentles. They place a lump of stiff ground-bait immediately above the hook; the few gentles on the hook then look as if they formed a portion of the neighbouring mass. This method cannot of course be used in the ordinary heavy barbel swims, but is more suitable to weirpools when the water is almost or quite shut off. **Clay-ball** fishing, as it is called, is very similar to this method, but can be practised in stronger streams. Clay into which gentles, greaves, or worms are worked is placed around a tiny cross piece of stick, which is tied into the line just above the bait, or the stick is placed a foot or more above the bait and the gut below, the stick is wound round and round the clay-ball and squeezed into it. This arrangement, if carefully made, can be cast out like a leger.

The barbel is a remarkably uncertain feeder; and to Izaak Walton's dictum that one can fish neither too early nor too late for him, there is nothing to be added. He is essentially a summer-feeding fish, and on the Thames the angler is most likely to meet with success after a fall of rain, particularly if the river is somewhat coloured. One of the most extraordinary takes of late years was made when there had been a long drought; the river had run low, and quantities of barbel had retired into a certain deep hole. Then came a freshet, the hole was fished, the fish fed eagerly, and large numbers were taken.

Considerable care should be observed in choosing a barbel-rod. With coarse tackle, the rod may be fairly stiff, but the water presses heavily on a stout line and, the barbel being shy and fairly well educated, as fine a line as possible should be preferred. A fine line and a stiff rod spell catastrophe; for the weaker the tackle, the more occasion there is for suppleness in the rod. The favourite line on the Thames is of eight plait silk, smooth, and softly dressed; and a leger is the most common form of tackle at the end of it. The Thames **leger** consists simply of about a yard of gut with a hook at the end; above it comes a foot of fine gimp, on which is slung a bullet, with a single shot so fixed on each end of the gimp as to prevent the bullet working on to the gut. Beyond the gimp may be still more gut, but this is not absolutely necessary. This tackle is cast out either off a Nottingham reel or in the Thames fashion, in which the line is pulled off the reel and coiled on the floor of the punt before the cast is made. After the leger is cast out, the angler awaits a couple of knocks or a steady pull, and then strikes, when, if the fish is large, he will encounter a determined resistance which is increased by the force of the water.

In most Thames barbel-swims, float-tackle is of little use, but in quieter waters, such as one finds in the Trent, and indeed in certain parts of the former river, heavy float tackle can be used with Nottingham methods. Of this Nottingham fishing there are practically two kinds. The more common method consists in allowing a float to work down stream and draw line off the reel. Sometimes the float is cast out and held back. In this last-mentioned method, called "tight-corking," the shot has to be heavy enough to keep the bait on the bottom and the float must be at a greater distance from the bait than the water is deep. Practically, the tackle amounts to a leger with a float, shot taking the place of the bullet. It is a particularly deadly method of catching large roach and other fish when a river is in slight flood and the fish are feeding on the bottom. For "long-corking," except where many shot are required, the favourite float is a quill from the wing of some large bird. For "tight corking," cork floats are more often used.

Much success with the barbel is not to be obtained without a considerable expenditure of trouble and perhaps money in **ground-baiting.** Several thousands of lobworms are usually placed in barbel-swims, either fixed in clay balls or thrown in loosely, or allowed to crawl into a sod of turf which is dropped into the river. Another plan is to place the worms with a stone or two in a paper bag, and sink the latter. The method to be adopted depends largely on the nature of the swim, local knowledge, and so forth.

The object of baiting is, perhaps, not so much to collect the fish as to get them accustomed to feed on a certain kind of food and to view it without suspicion. Their suspicions being lulled, they take the worm on the angler's hook for a time, but as soon as a few fish have been pricked and lost, or the swim becomes disturbed by other reasons, the effects of the ground-bait appear to wear off. Greaves and cheese should be used very sparingly as ground-bait, as they appear to sicken the fish, and lob-worms should be thrown in whole, otherwise the small fry will get them. It is judicious in an ordinary swim to throw in about 500 worms one morning, 300 twenty-four hours later, and fish it on the morning of the following day. While one is fishing, worms or pieces of worms should be thrown in from time to time, and the choicest and the best scoured should be selected for the hook. In large pools, where barbel are plentiful, many more worms may be thrown in with advantage.

The **Roach** (*Leuciscus rutilus*) is of all fish the one which yields sport to the largest number of English anglers, and is beloved of the clubmen of both London and the Midlands. A bright, handsome fish, playing for a short time strongly if caught on fine tackle, it is shy to a degree in much-frequented waters. In winter, if properly cooked, it is by no means despicable as food.

Slider Float.

In the commencement of the season, roach are found in the swiftest streams of a river, where they probably go to become reinvigorated after the efforts of spawning.

As summer advances, they get into slightly deeper water, and wherever there is a nice, gravelly and sandy bottom, and weeds, reeds or rushes, they may be looked for. In winter, their swims depend largely on the state of the water and the temperature. If it is very cold, they seek the deepest waters, while if it is warm, they work out into streams of moderate depth. Thick water invariably sends them into shallow swims, which is a point to be remembered, while, when the river runs very clear and the frost is severe, they may be looked for in the deepest holes. Under ordinary "summer" conditions the best fish will be found in running water. All fish, it should be noted, rather favour eddies during a flood, for there food is swept and shelter is obtained from the strength of the current.

The baits for roach are simply unlimited in number and variety. There is hardly any kind of paste which they will not take, and they feed eagerly on wasp-grubs, gentles, the larvæ of all kinds of flies, and water insects, and are often caught on the silk weed. To grain, if stewed until it is tender, they are very partial in certain rivers, and even in those waters where it is not regarded as a suitable bait the fish can be induced to feed on it by baiting up swims some days in advance.

[*Photo. by W. B. and S. C. Johnson.*

ROACH.

The most common method of fishing for roach is with float-tackle, and this may be either used with a tight line, that is to say, the line being made fast to the end of a long rod, or with running tackle. Where rivers are shallow and it is desirable to be at some distance from the fish, there the Nottingham method of casting out a float and allowing it to travel with the stream is certainly the best, but in deeper waters, where the fish cannot, it may be presumed, see the angler, there the tight line, or Lea method, accounts for the most considerable baskets of fish. Where roach are shy and much fished for, the angler cannot strike too quickly on perceiving a bite. It is obvious that with a tight line and the point of the rod held only a foot or two above the float, the strike can be made quicker than where the float has travelled ten or fifteen yards down stream; not only in the latter case has the elasticity of the line to be overcome, but there is a loss of time between the actual strike and its effect on the fish, during which the bait may be, and often is ejected.

On the Thames, the bank-angler commonly uses a long bamboo roach-pole and tight line; but large numbers of roach are caught from punts moored across the stream by means of poles called ripecks, the angler lowering the line over the side of the punt, letting the float travel three or four yards, then drawing it in and taking a fresh swim. While this is going on, the attendant will from time to time deposit balls of ground-bait over the side, which keeps the fish together and induces them to feed, *if* not given with a too lavish hand.

Roach-fishing is so largely practised, that many refinements of tackle are affected by the professors of the art, one of the most important of which is, in our opinion, the staining of the gut and the colouring of the hook-shank. In winter the best colour for gut is brown, in summer, green to match the weeds, while the hook-shank should be coloured according to the bait; that is, if gentles are used, white or a very pale yellow; if wheat, wheat-colour; if worms, a brownish-red, and so on. These colours are easily made by mixing a little French polish with the dry colour obtained of the oil-and-colourman. The mixture will dry very quickly.

It is not every tackle-maker who sells roach-hooks mounted on sufficiently fine gut, for the houses which supply trout- and salmon-fishermen almost ignore this branch of their trade. To obtain the best roach tackle, it may therefore be necessary to go to the houses which are patronised by the London bank-anglers. As to the best shape of hook for roach, there is a diversity of opinion, many anglers preferring the crystal bend, while others declare there is nothing so good as the round bend. Silkworm gut is now drawn much finer than horsehair, but not a few anglers still swear by hair on account of its durability, absence of glitter, and for other reasons. A length of drawn gut will fray in the course of a day and, it is believed, is then more visible to the fish than the coarser horsehair, which may perhaps be taken by the fish for a piece of brown weed or some similar natural object.

Baits.—To revert to the subject of baits—paste, gentles, and creed or stewed wheat, certainly take the highest rank, and it is a singular fact that in many rivers only small roach appear to prefer gentles, while the larger fish are caught on wheat or paste. In the early part of the season, a red worm is sometimes found a good bait, and in certain waters, among which the Thames is not one, is regarded all through the year as even better than gentles or paste. In winter, the lobworm is one of the best baits that can be used, provided the water is slightly coloured.

In roach-fishing, ground-bait is all important, and it should be in nature somewhat similar to the hook-bait. One of the best and most commonly used consists of the waste crusts from the bread pan scalded until they are quite soft, the water squeezed out of them, and kneaded into a stiff consistency with the addition of fine bran. To this may be added a little boiled rice, creed wheat, or other food which the roach favour. The amount to be put in depends on the extent of the river and the quantities of fish which are believed to be about. It is obvious that if there is only a shoal of fifty roach it is useless to throw in enough for two thousand. The fifty fish get gorged and refuse to be caught. One of the secrets of success in roach fishing is to put in a little ground-bait frequently and so induce the fish to keep looking about for food. To throw in a quantity of ground-bait at once simply gives them a big feast, after which they retire contentedly to some shady corner out of the way of hooks, floats, and anglers.

A great many roach are caught on the leger, such as described under the head of Barbel fishing, but it need hardly be said that for this fish the gut should be much lighter than that used for fighting the heavier tenants of the weirpool.

In some rivers, roach come on to the shallows during the summer and will take an artificial fly, particularly if the hook is tipped with a gentle. The fly should be allowed to sink and then be drawn slowly through the water, and the angler should not strike until he sees the line tighten, as the roach does not rise like a trout, but swims for some distance after the fly before sucking it in.

The **Rudd** (*Leuciscus erythrophthalmus*) closely resembles the roach in appearance, but it is rather deeper in the belly, has a tail more forked, and its red parts are more brightly coloured. A simple method of distinguishing the two fish is to examine the upper lip. This in the roach will be found capable of a slight elongation and can be pulled down, a convenience which evidently enables the fish to pick up food off the bottom. With the rudd, on the other hand, the upper lip is of a hard, bony, immovable nature.

Rudd are not now, so far as we know, found in the Thames, but are exceedingly plentiful in the waters of Norfolk, Suffolk, and Cambridgeshire, and in many ponds. They will take all the usual roach baits, but are particular favourites with the angler by reason of their readiness to seize (rather than to rise at) an artificial fly. Slapton Lea in Devonshire is a noted water for fly fishing for rudd. In hot weather shoals of these fish love to swim over muddy shallows, the bottom of which is paved with weedy verdure. Approach them cautiously and cast a fly in their midst, and the whole shoal will swim towards it, the largest after following it for a yard or two sucking it solemnly into its mouth. In some cases, skilful fly-fishers will, by exercising great care in their method of approaching and playing the fish they hook, kill half the shoal or more before the fish take alarm. Float-tackle, used when the fish are near the surface, should be cast a long distance, the angler keeping as low as possible.

[*Photo. by W. B. and S. C. Johnson.*

RUDD.

The **Dace** (*Leuciscus vulgaris*) is a bright silvery fish, slimmer in shape than, and lacking the red fins of, the roach. It is caught by much the same methods as its more corpulent cousin, but in addition rises like any trout to a fly in shallow waters, and the young would-be trout-fisher cannot do better than try his hand on these pretty fish. Almost any small fly will tempt them, and if they will not rise to the black gnat or other dark fly, a bright Soldier Palmer, or white-winged Coachman should be tried. In some rivers, they commonly disdain a wet fly and are as a rule only to be caught with a carefully dried dun or other floating fly.

Some of the best dace fishing near London is to be obtained in the tidal waters of the Thames, where these fish abound. There, they are usually caught from punts, and it has become a common practice of late years to stir up the bottom behind the punt with a gudgeon rake. This proceeding disturbs various water-insects and slightly colours the water, so that the fish, heading up stream towards the source of the discoloration, come upon the angler's tackle and are caught. Very large dace are often taken by the barbel-fisher, and are in fact regarded by him as a great nuisance. When it is found that there are continual bites which are being missed, and that the lobworm is being bruised about the head, the presence of dace may be at once suspected, and the way to clear the swim of a few is to bait with the head of the lobworm alone. Though dace are mainly a fish of the shallows, the larger members of the family are frequently caught in deep waters, where their presence would not be suspected.

[*Photo. by W. B. and S. C. Johnson.*

DACE.

The **Chub** (*Leuciscus cephalus*) is another fly-taking fish, and though almost worthless as food, and treated to words of opprobrium in many a trout stream, he is beloved of Thames and other anglers for the fine sport he affords. Like many other fishes, he seeks the shallows at the commencement of the season, after spawning, but soon retires to holes beneath overhanging willow trees, where anyone peering cautiously over the bows of the boat or punt on some bright sunny day may see a shoal swimming in and out the maze of roots which project into the water. There they lie the summer through, feeding on beetles and caterpillars and other insects which fall into the water from the overhanging branches. In much-navigated rivers, the fly cannot be used with great success except in early morning, because as soon as the first launch or boat has passed, the fish which are basking near the surface sink to a depth at which they disregard artificial flies. Still, there are many retired shallows and places in which chub may be found until the end of August, and there the fly-fisher still has his opportunity.

In fly-fishing from a boat, success depends as much upon the boatman as on the fly-fisher, the slightest roll of the craft or splash of the oars scaring the fish. The chub indeed is above all famous for his extreme distrust of man. If unaware of the angler's presence, he will take a bait presented to him on tackle of astonishing coarseness, but if he once obtains an inkling that his dread enemy is in the vicinity, no bait, however tasty, presented on the finest of tackle will tempt him. This, of course, as a general rule.

In addition to the flies, which should be large and dressed rather full and heavily hackled, small frogs, lobworms, a bunch of gentles, a piece of beef fat, crayfish-tails, and the large black slugs which come out at night after a showery day, are all placed before this fish by means of a fly-rod.

In deep holes, many a good chub is caught by means of leger-tackle, the bait being greaves or cheese, but perhaps the most general and successful method of angling for these fish is with Nottingham tackle. A large quill float, fairly heavily shotted, is sent by the side of the bank down stream right among a shoal of chub which, owing to the distance between them and the angler, are without suspicion. One of the most favoured summer baits is cheese-paste, while in the winter there is nothing to equal a piece of marrow or pith, previously scalded, from the spine of a bullock. The brains, which have also been scalded, are

[*Photo. by W. B. and S. C. Johnson.*

CHUB.

thrown in as ground-bait. The best line for this particular method of fishing is made of pure undressed silk, either twisted or plaited. The rod should be rather long and powerful to hold the fish from out those roots towards which he is certain to swim when hooked, and the whole proceeding must be conducted with the greatest care and caution. Not many chub are often caught from one spot, and the angler who tries place after place will catch many more than he who sits quietly waiting for the fish to come on the feed.

[*Photo. by W. B. and S. C. Johnson.*

BREAM.

The **Bream** (*Abramis brama*) is a flat-sided, deep-bellied, hog-backed fish, which abounds in many Midland and East Anglian waters, and is also found in the Thames. Generally speaking, it is a night-feeder, and enormous numbers are caught between the hours of two or three, and five o'clock in the morning during the months of July and August. In the Thames, a few are caught in barbel swims, and these appear to feed during the day. They are taken there with the leger, but in the slow-flowing rivers of the Fen country the favourite tackle consists of a rod somewhat akin to a hop-pole, a piece of twine, a float such as a Thames angler would use for jack, and what is commonly known as a "penny hook." The penny hook is tied immediately to the twine, and above the knot is a strip of lead, probably cut off the nearest gutter. With this very primitive tackle as many fish seem to be caught as with the finer gear used by the Thames anglers. But it is to be remembered that the rivers of the Midlands are more highly coloured than the Thames and Lea, and, as we have said, the fishing is carried out in the early morning when the light is not very good, circumstances under which fine tackle is not particularly called for. The float, too, is so arranged that at least a foot of the line lies on the bottom, and thus is but little observed. Even the worm may be more or less covered with mud, and has to be routed up by the snouts of the fish. As a rule, bream-swims are heavily ground-baited, a favourite bait for this purpose being brewers' grains. The hook bait is usually a worm, but the fish will also take gentles, paste, and creed wheat.

So little do bream feed in the daytime on Midland rivers, that in some of them an angler might fish day by day for a year without discovering that there was a bream in the river. The bream to which we are alluding are the large, bronzy fellows which grow to a considerable weight; but in the Norfolk broads and other waters there is a smaller fish of the same family called the **Bream-flat** (*Abramis blicca*), which is caught in immense numbers and rarely attains a considerable weight. We have taken these fish on paternoster, leger, and other tackle, and when well on the feed there appears to be no limit to the numbers which may be lifted into the boat.

The essentials of bream fishing, in short, are to fish at an exceedingly early hour in the morning, in fact before daybreak, to moor the punt in a bream-hole, to allow a portion of the line to lie on the bottom, to ground-bait sufficiently some twenty hours previously, and also during the fishing. Of course, the angler should be careful not to disturb the swim. That rule applies to fishing of all kinds.

[*Photo. by W. B. and S. C. Johnson.*

PERCH.

The **Perch** (*Perca fluviatilis*), which may be instantly recognised by his striped sides, hog-back, and prickly dorsal fin, is one of the most sport-yielding, and at the same time best table, fish found in fresh water. When large, he is by no means easily caught, but in the days of infancy he bites boldly and foolishly, particularly in ponds.

Like the roach and some other coarse fish, he is found in the streams in spring and summer, retiring to deeper water in winter, the best time to make a large bag being when the river has been in flood and the water has sunk and cleared a little, and the fish have not yet left the large eddies in which they congregated to avoid the force of the current. If, added to these conditions, there are a few frosty nights to whet their appetites, the captures made are likely to be heavy.

In summer time, perch are scattered about the river, and the angler who understands how to use the paternoster will take one here and another there from among holes in the weeds, by the side of the camp sheathing, and near any old wreckage or timber work.

For large perch, there is no better bait than a live gudgeon, but minnows are more commonly used, perhaps because they are more easily obtained. On lakes and ponds, the red worm is very deadly; and in rivers, when the water is much coloured, there is no bait better than the worm. During a summer flood, if a shallow and not too swift swim is baited up with lobworms, good sport may be expected, and the tail of a lobworm is great medicine whenever the water is at all thick. When many anglers consider the Thames quite unfishable, owing to the thick water, there are a few who swim the tail of a lobworm round small eddies close to the bank, taking out a perch here and a perch there, and occasionally chub and roach. In lakes, perch sometimes take flies, such as a large red Palmer, and they will dash at small bright spinning baits at any time and in any water.

The **paternoster**, a piece of tackle rarely used for any other fresh-water fish except perch, is to be made in the following manner: Take a three-yard length of fine gut and make two loops in it about eighteen inches apart, the lower one being only three inches above the end of the collar. To this lower end attach a pear-shaped lead of about half an ounce or less, the other end being fastened to the running line. Fasten to the large loops in the upright portion of the gut two No. 7 hooks, the gut of which should be shortened to above five inches. The paternoster is then ready, and a very much better one than can be purchased in the shops. In rivers, this tackle is baited with minnows or gudgeons (these necessitate larger hooks) and shot rather than lowered into places where perch are expected. The rod should be held exceedingly steady, and immediately the little tap-tap at the point is felt, which denotes a perch, the point should be lowered for a second or two, then, if it be evident that the fish is feeding, there should be a gentle strike. For a perch of half a pound or upwards it is best to use a landing-net, as these fish have large and delicate mouths from which the hook often comes away in their struggles.

In ponds and lakes, the same tackle may be used, substituting worms for minnows, though minnows are preferable if they can be obtained. Where worms are the bait, it is as well to have a good supply and to throw in a few occasionally to keep the perch round about and on the feed. Almost the same float-tackle can be used for perch as for roach, except that it may be a trifle coarser, and the hook a little larger; but as regards the hook, this should always suit the bait in the matter of size.

If there is some place where perch are known to be and the fish are exceedingly shy and difficult to catch, it is a good plan to use the finest possible float-tackle, and to wait patiently till a perch takes it; and, as we have said, if worms are the bait, a few should be thrown in from time to time. We have known perch caught on leger-tackle in rivers when they could be taken by no other means, the bait being a gudgeon. The reason probably is that the gut of the leger lies on the ground and is not seen by the fish, whereas with float tackle or a paternoster, a very visible line comes from the surface of the water to the bottom immediately over their heads.

Tench (*Tinca vulgaris*) may be easily known by their greenish-bronze colour, small bright red eyes, and minute scales covered with a thick, tenacious mucus. When of small size in ponds, they are easily caught with paste or worms, but when large, whether in rivers or ponds, they are, as a rule, shy to a degree, but bite well enough when the water is thick. In rivers they should be fished for carefully close to the edge of, but not on, a bank of mud from out of which grow water-lilies and other weeds, and if there is an old root or two about so much the better. They may be caught either on float or leger-tackle, or by the method termed "tight-corking," already described. They feed best in spring and early summer, but are sometimes taken in winter if the weather is mild and the water coloured. One secret of success is to use a small hook, thoroughly well covered with the bait, and give the fish plenty of time. Congealed blood is used as a bait with much success in some canals and other waters. With it, the strike should come sooner than with worms.

Those who would catch large tench should be on the water soon after daybreak.

[*Photo. by W. B. and S. C. Johnson.*
GREEN TENCH.

The **Carp** (*Cyprinus carpio*) is perhaps the shyest fish that swims. It is usually angled for during the summer, one of the best baits being a parboiled potato placed on a small triangle by means of a baiting needle. Paste sweetened with honey, worms of various kinds, boiled wheat, green peas, wasp-grubs, cheese, &c., are also used with varying success.

Carp are mostly caught in the very early morning or late evening. Ground-bait is essential, and it should resemble the hook bait but be coarser in character. In suitable places the leger answers well, as it is less visible to the fish than other tackle. But those anglers who can cast out a float a considerable distance use that form of tackle with much success in lakes. In enclosed waters, it is a good plan to bait up several spots and, after catching a fish from one, to go to another, so as to give the first swim a rest.

[*Photo. by W. B. and S. C. Johnson.*
CARP.

There are few baits which the **Eel** (*Anguilla vulgaris*) will not take, and few waters in which this valuable food fish is not found. The leger and ordinary float-tackle baited with worms are both much used. There is also a method called bobbing, or clod-fishing, which consists of stringing a number of big worms from end to end on a piece of worsted, looping them up into a lump resembling a small mop-head, and lowering them to the bottom by means of a cord and a short stout stick or bamboo. The eel's teeth catch in the worsted and the fish can be lifted up and dropped into a pail in the punt. Bobbing is much practised at the mouths of streams during a rise and discoloration of water.

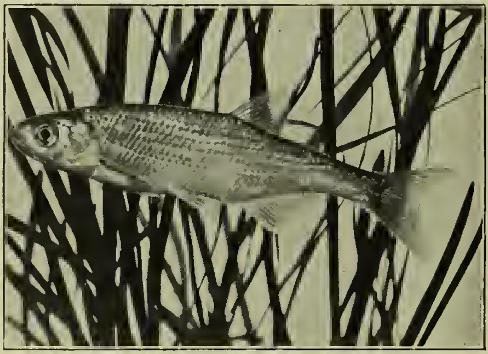
On hot summer days when eels are lying in holes in banks, sniggling is practised. The sniggler takes a long needle, whips on a piece of fine line to the centre of it, and inserts the needle in a worm, just bringing out the point, which is stuck into the end of a stick. The needle encased in the worm is then placed in front of the eel's nose, and if it is taken and swallowed the sniggler puts on a gentle but continuous pressure until the eel's strength gives way and he is drawn out with the needle athwart his throat.

[*Photo. by W. B. and S. C. Johnson.*
GUDGEON.

Eels are also caught in baskets, which should be baited with live gudgeon. The best baskets are made of withies. We cannot recommend those constructed of wire. Thousands of eels are taken in fixed traps or weirs, and in eel-nets placed across the rivers of Norfolk and Suffolk. Spearing eels is very good fun. Sometimes the method is practised indiscriminately over mudbanks, or if the water is clear, the mud is prodded only where blow-holes are seen. In spring-time, the spear is used in the feathery green weeds, beloved of pike, which are seen in masses on the bottom of rivers.

The **Gudgeon** (*Gobio fluviatilis*) is a small, round-bodied, brown-backed fish, which abounds in many rivers, and, as a general rule, is very easily caught. Like the barbel, which it somewhat resembles in shape, it is a summer-feeding fish, and is caught close to the bottom.

For this branch of angling, fine roach tackle is most suitable, but the hook should be very small and baited with a fragment of red worm or brandling. At the slightest depression of the float the angler should strike. Ground-bait is rarely used for gudgeon, the better plan being to disturb the bottom from time to time with a heavy long-handled rake made for the purpose. It is important to plumb the depth and adjust the float with great accuracy. The bait should float down stream as near the bottom as possible without touching it. On the Thames, bags of twenty dozen or more of these fish are sometimes made by two rods in a day. As regards choosing a swim, the fish love a shallow over which the river flows gently, on the edge of a deep hole. As the summer wanes, they gradually get into deeper water. The bottom should be sandy gravel, *i.e.*, not too hard. As a table fish, gudgeon are most excellent, and they make first-rate baits for perch, pike, trout, and salmon.



[*Photo. by W. B. and S. C. Johnson.*
BLEAK.

There only now remain the small fry which are principally used for bait. **Bleak** (*Alburnus lucidus*), however, rise eagerly to a fly, and are caught without difficulty by means of a single gentle, caddis, or piece of paste. They afford grand sport to the young angler during the summer, and, particularly if toughened in spirits of wine, or other preservative, are first-rate spinning baits if mounted on the Chapman spinner or one of its varieties.

The **Minnow** (*Leuciscus phoxinus*), a useful bait, is found in most brooks and rivers, and is best taken by means of a square or round net with fine meshes which is lowered to the bottom. As soon as the minnows swim over, it is rapidly lifted.

[*Photo. by W. B. and S. C. Johnson.*
POPE.

The **Stone Loach** (*Nemacheilus barbatula*), Colloch, or Colley bait of Ireland, is also a valuable bait, particularly for salmon and trout, and is usually caught by turning over the stone under which it lies. A tap with a hammer on the stone will sometimes stun it.

The **Ruffe** (*Acerina vulgaris*) or Pope is a kind of miniature perch. It is shaped like the perch, but has the colour of a gudgeon. It exudes a nasty slime, and has some poisonous spikes on the corner of its gill covers. It has a vexatious habit of swallowing the bait and hook.

The **Miller's Thumb** (*Cottus gobio*) is a quaint monstrosity, nearly all head. It is found under stones in the shallows of small brooks.

[*Photo by W. B. and S. C. Johnson.*
THE MILLER'S THUMB.

Of the **Stickleback** (*Gasterosteus spinulosus*), of which there are several varieties, little need be said. From the naturalist's point of view it is highly interesting as to its breeding habits, and urchins may be seen catching them any day by means of a red worm tied to the end of a piece of cotton. The greedy stickleback half swallows the worm and is lifted out before it has time to leave go.

The **Lamprey, Burbolt,** or **Eel-Pout,** the **Azurine,** the **Vendace,** the **Powan,** the **Gwyniad,** and the **Graining** are other rare fish, of a kind which do not as a rule afford sport to the angler.

(The **Flounder,** which is found indifferently in fresh and salt water, is dealt with under the head of **Sea-Fishing.**)

JOHN BICKERDYKE.

AMERICAN ANGLING.—[*See* **Black Bass, Ouananiche, Tarpon,** &c.]

INDIAN ANGLING.—**Mahseer.**—The Mahseer (*Barbus tor*), the largest of the Carp family (*Cyprinidæ*), commonly running to fifty pounds in weight, and attaining as much as one hundred and fifty pounds, has its habitat only in large, rocky, mountain rivers. In such rivers, it is distributed throughout the continent of India, extending into Afghanistan, Chitral, Burmah, and China, and seemingly Japan also. It is the most sporting fish in the East, the violence of its first rush on feeling the restraint of the hook being astounding, and constituting a special difficulty in its capture. It does not take the bait, as a salmon or trout ordinarily does, leisurely rising and leisurely returning to its place, but with a sudden blow which takes the angler by surprise, and which will even jerk the salmon-rod out of his hands, if he is unprepared. And this blow is instantly followed by a violent rush to which the run of a salmon can bear no comparison. The rapidity of this rush is accounted for by measurements of the tail and fins as compared with the rest of the body of the fish, which show that the superficial areas of the propelling and directing powers amount together to as much as the superficial area of the whole of the rest of the Mahseer's body. The sudden jerk and violent rush make it necessary to fish for it with a thoroughly *pliable* salmon-rod, that will yield to the first rush more rapidly than it is possible for the angler's hand to do, to yield indeed before the effect of the blow has even reached the angler's hand, and so to allow the line to run out, but for which the strongest tackle that can be well used with a rod must be broken. The tackle too must be good and strong, and the running line, the same as for salmon, should be one hundred and fifty yards long. Other rushes also the Mahseer will make before he yields, but none such as his first for suddenness and rapidity.

Another peculiarity of the Mahseer is that, differing herein from most predatory fish, it has no teeth at all in its soft, leathery mouth. In lieu thereof, it is furnished with great muscular power of jaw, by means of which it can exercise such a violent power of compression, that its prey is stunned and squeezed lifeless at the moment of capture. I have even noticed a fishing spoon, the size and thickness of an ordinary dessert spoon, crumpled up by it like a piece of paper. The spoons used must therefore be stout and strong, and the hooks of specially stout wire, not to resist tension, but to stand this violent power of compression. To produce the results it does, the Mahseer must also have a property very unusual in a fish, but with which we are familiar in the Tiger and its pad, of rigidifying the soft parts of the mouth at the moment of delivering its blow.

The smallest Mahseer can be taken with an artificial fly, the size of a salmon-fly, in the smaller tributaries, and in the shallows; but the best lure for the larger Mahseer is undoubtedly a small fish, or its imitation a spoon; and spoons are more used than any other bait, and of sizes varying from three-quarters of an inch to three inches in length, the general preference being for spoons one and three-quarters to two inches long. The three-inch spoon is used only in deep waters, for the rocky pools in which Mahseer delight are often twenty feet deep, and there the larger spoon shows best. The spoons must be mounted with treble hooks made of specially strong wire.

When the water is flood-coloured, Mahseer may be taken legering with a live bait at the bottom. In places where frogs abound, they are also taken with that lure, and if the place has been freely ground-baited, they may also be taken with parched grain bored to receive the hook. But this last style of fishing is only practised in special localities.

When rivers are coloured and chilled with melted snow-water, the Mahseer will take no bait. The best season in the South and on the West Coast is August, September, and October, when the rivers have cleared from the floods; while in Northern India it is, with exceptions, March and October.

In flood time, Mahseer migrate long distances up stream, ascending thousands of feet for the purpose of spawning at altitudes at which the water, though deep enough to hold the parent fish in flood time, will, by the time the spawn is hatched, have so dwindled that only tiny fry can stay in it, and the tiny fry will thus be safe from their larger predatory parents, which have meanwhile dropped down stream to their former habitats in the deeper rocky pools.

Rohu.—The Rohu, Rahu, Rohi, or Rohita, as it is variously called in various localities, is the *Labeo rohita* of science, and may be taken as a typical specimen of the genus *Labeo*, of which genus there are twenty-five species. Of these, eight run large, attaining respectively to one and a half feet, two feet, three feet, and nearly five feet in length. The Rohu is distributed all over Northern India, attains three feet in length, is well known for its high edible qualities, and the excellent sport it shows, and it has been caught on the rod up to fifty-four pounds. As fry, it enters reservoirs through the river channels by which they are fed. The manner of its capture bears some similitude to roach-fishing, but the Rohu is as far above the roach in the nicety of skill required for its capture, in the play it shows when hooked, and in its flavour on the table, as it is in size. After ground-baiting for three days, it is fished for with a lump of paste bait from the size of the thumb-nail to the size of the end joint of the thumb, on a No. 1 Limerick hook, resting on the ground, the depth having been taken, and the float adjusted and re-adjusted with such careful accuracy, that it neither lies down upon the water nor stands straight up, but is tilted so as to ride at an angle of about forty-five degrees with the surface of the water. This float, a special one, much more sensitive than anything used in roach-fishing, known in India as the Detective, is made of six inches of the stem of a peacock's tail feather, selecting the part that is one-eighth of an inch thick, with a loop attached at the thin end only. Half an inch at the top end is painted vermilion with oil colour, half an inch left white, and then again red and white alternately till there are three half-inch bands of red and two of white, the rest being left white. The rod too is a special one, much stronger than a roach-rod, but as light and rigid, made of what is called in the tackle trade "whole cane," though it is not cane, which is a ground-creeper, but bamboo, which is a grass. The bamboo is a special one known as the Ringol, or solid bamboo, and is ten feet long. If longer, the float would be too far off for the bites to be visible. The float is exactly under the rod-top. The line is of single stout gut at the end, and no shot are put upon it, only a little soft lead wire is wound round the head of the hook, so that it will rest on the bottom, and be concealed by the bait. The running line has to be fine so that it shall not weight the very sensitive float. In the rains the Rohu bite so freely that any ordinary roach-float would suffice, and the stroke should be made as for roach. But when the periodical rains have passed, or where the Rohu have been much fished, they bite so subtly, that the bite of a ten- or twenty-pound fish would not be perceptible on an ordinary roach-float. With the Detective float the first sign of a bite is given by the float leaving the angle at which it rode, and standing upright, thus attracting close attention to the fine bite that is to follow. Then the float begins to move up and down, but so slowly and so slightly that the eye could not follow the movement but for the aid of the alternate bands of red and white. This may go on for minutes that seem hours, the float going gradually and very slowly deeper and deeper till it nearly goes under, but it is of no use to strike till there comes a *rapid* succession of small bobs, sometimes no more than a vibration or quiver, but *rapid*. Then is the critical second, and the stroke must be delivered instantaneously, or it will be too late, and the same fish will thus steal the bait ten or twenty times, unless the angler is quick at the critical second. If he is, his reward is a fish that may be only two pounds, or may be twenty or thirty or more, and will make a good fight before it can be landed with so light a rod and tackle. The stolen bait serves to keep the fish round the angler, and when once the fish are collected the bites frequently follow each other in quick succession. But it nevertheless requires great quickness of eye and hand to make a good bag. One rod has been known to kill two hundred pounds weight in a day, from twenty-seven pounds and twenty-three pounds each downwards, the smallest being two pounds.

Kalbans.—Kālbăns, the usual abbreviation of the more correct vernacular Kālăbăns, is *Labeo calbasu*, the scientific name having been incorrectly adopted from the vernacular. It is a thick, deep fish running to three feet in length, and certainly over twenty pounds in weight, found in the still waters of rivers throughout India; like the Rohu, getting as fry into reservoirs by the channels by which they are fed, flourishing there, and there fished for just like the Rohu. It adds to the sport that the bite of one is so like the bite of the other, that conjecture is busy as to which fish may be biting.

Mirgha.—The Mirgha (*Cirrhina mirgala*) inhabits the same waters as the Kalbans, grows to the same size, and is fished for in precisely the same way, but is a more active fish in play.

White Carp.—The White Carp (*Cirrhina cirrhosa*) grows to half the size of the Mirgha, but is otherwise similar, in locality, method of fishing, and activity.

Catla.—The Catla (*Catla buchanani*), a thick fish that attains six feet in length, has been caught with a rod up to one hundred pounds in weight, in the same localities, at the same time, employing the same baits and tackle, as for Rohu. It is much esteemed as food.

Carnatic Carp.—The Carnatic Carp (*Barbus carnaticus*), though sometimes found in the runs, generally affects the stiller parts of the same rivers as support the Mahseer, though it also strays further into the plains away from the foot of the mountains, not being so dependent on rock for its food supplies. It attains twenty-five pounds, but is more ordinarily taken from two to seven or eight pounds. Swimming in shoals like dace, and rising to a fly in the same manner as they do, it affords excellent sport to the angler fishing with a fourteen feet double-handed trout-rod, casting three flies, the sizes of a medium and a small salmon-fly, and of a large loch-trout fly, on a collar of single salmon-gut. They are chiefly found in the deep eddies under the shade of the forest trees, whose leaves and flowers they largely feed upon. The larger take a small trout spoon readily.

Chital.—The Chital or Seetul (*Notopterus chitala*), which favours the larger rivers of Northern India, Burmah, and Siam, attains four feet in length. Silver sided, very flat and deep, it feeds on the bottom, but swims horizontally, and is a very game fish to the angler, leaping four feet into the air again and again on being hooked, and otherwise showing great activity. It has a very small head and mouth, so the bait must be small, and there is none better than its natural food the small mullet (*Mugil cascasia*), three and a half inches long, mounted on small trebles, and spun very slowly close to the bottom, where it may be allowed to rest from time to time. The bite of this large fish, which runs to eighty pounds, and is very commonly taken at twelve or sixteen pounds, is a very small nibble, which it needs a light hand to feel, and which must be answered immediately. It has a smaller congener in Southern India, *Notopterus kapirat*, which does not run over two pounds, and may be taken in the same way, or with prawn or worm.

Freshwater Sharks.—Indian rivers supply many of these Siluroids, of which it will suffice to mention *Bagarius yarrellii*, *Silundia gangetica*, *Wallago attu*, which have no English synonyms, except that of Freshwater Sharks, and each of which attains six feet in length, and two other *Macrones* which run to much the same size. They feed mostly at the bottom, using their feelers as much as their eyes, and should be fished for with a live bait of about half a pound on a line weighted to the bottom, the hooks being such as would be used in England for Pike, mounted on stout gimp or wire, as these fish have very formidable teeth, and a grip so strong that it is very difficult to loosen when once they have closed on an object. For landing them, a gaff-hook is necessary. Though they offer strong resistance, taking out line with no denial, they display no great activity, and therein sink, as a game fish, to the low level of the Pike, though as regards size and teeth, they compare with him much as a tiger might with a cat. Space will not allow of the mention of the numerous species of lesser Siluroids with which the waters of the East abound.

Baril.—There are several species of *Barilius*, running about the size of a hungry beck-trout, which are keen takers of a small trout-fly, as many as seven dozen having been taken in a forenoon. One of the genus Baril (*Barilius bola*) is said to attain five pounds in weight, but ordinarily runs to one and a half pounds, and swimming in shoals, as many as three have, on occasion, been taken at one cast on a collar of three flies the size of a loch-trout fly. Though not of the *Salmonidæ*, they bear such a strong resemblance to a Trout, that they are commonly called the Indian Trout, and are held in very high esteem by the angler as a sporting fish.

Chilwa.—The Chilwa (*Aspidoparia morar*), misnamed by science *Chela*, may be called the Indian Bleak. So small a fish (six inches) would not be mentioned, but for its extraordinary numbers and the rapidity with which it may be taken with a small fly, which make it very popular with some, forty, fifty, and even sixty having been taken in an hour by one rod with two flies up.

Ba-min and Begtie.—These are sea fish entering estuaries, to be taken similarly, spinning as for Salmon, but with hooks mounted on gimp or wire.

The Bâmin (*Polynemus tetradactylus*) attains six feet in length, and commonly runs from ten to twenty pounds, and is celebrated for the amount of tackle it breaks, on account of its extraordinary activity and strength. The Begtie (*Lates calcarifer*) runs over thirty pounds, and is much esteemed for food. It is known to Europeans as the Cock-up.

Megalops.—*Megalops cyprinoides* is estuarial, but accommodates itself to fresh water in ponds, runs to 18 in. in length, and may be taken with a white loch-fly or a trout-spoon. It is active.

Marral.—The Marral (*Ophiocephalus marulius*) attains four feet; four other species of the same genus attain three feet. They are found in the still pools in rivers, and in ponds, are similar to the Pike in their habits, but are best taken at the surface with a live frog.

Hilsa.—The Hilsa (*Clupea ilisha*) is far famed for its specially excellent flavour, and is said to take a white fly. But to treat of these, and Mangoe fish, and Mullets numerous, and Eels of sorts, and Gudgeon attaining 18 in. in length and three pounds in weight, space will not allow.

H. S. THOMAS.

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ANTELOPES (Characters and Distribution of).—The term "Antelope" is so familiar to all, that it may be a matter of surprise to many to learn it is one totally incapable of definition. Nevertheless, this affords no reason for the rejection of the name, which, in its widest sense, is the most convenient collective title for a large and important group of Hollow-horned Ruminants coming under the designation neither of Oxen, Sheep, nor Goats. By zoologists, the Hollow-horned Ruminants, or *Bovidae,* are divided into a number of sectional groups, or sub-families, one of which includes the Oxen, and a second the Sheep and Goats, while the others contain among them the various Antelopes and certain forms serving to connect the latter with the Goats. It is thus evident that the term "Antelope" has not the same zoological significance as Oxen, but comprises a number of more or less distinct groups ranking in the same grade as the latter. Some of the groups of Antelopes are, indeed, closely related to the Oxen—with which they are connected by means of the Anoa of Celebes—while others exhibit an equally intimate relationship with the Goats and Sheep.

In its widest acceptation, the term Antelope may, as already said, be taken to include all the members of the *Bovidae* which are neither Oxen, Sheep, nor Goats. There is, however, an intermediate group connecting the more typical Antelopes with the Goats, and hence termed the Goat-like Antelopes. These are all mountain-dwelling forms, and include the Gorals (*Cemas*) and Serows (*Nemorhaedus*) of Eastern Asia, the Himalayan Takin (*Budorcas*), the so-called Rocky Mountain Goat (*Haploceros*) of North America, and the European Chamois (*Rupicapra*)—the latter being the most Antelope-like of all. Eliminating these transitional forms—which constitute a sub-family (*Rupicaprinae*) by themselves, ranking with the Oxen (*Bovinae*) and Sheep and Goats (*Caprinae*)—it is somewhat less difficult to give an approximate definition of Antelopes in a popular sense. True Antelopes, then, are Hollow-horned Ruminants, generally of more or less light and elegant build, and carrying the head raised considerably above the line of the back. Their horns—which may be present either in one or both sexes—differ greatly in relative size, but are quite different from those of either the Oxen or Sheep. As a rule they are more or less cylindrical, while they are frequently somewhat lyre-shaped, and are often ringed for a longer or shorter distance above the base. In most cases their direction is more or less upright; and in certain instances they are spirally twisted. A very general, although by no means universal, feature of Antelopes, is the presence of a gland beneath the eye, such glands being wanting in the Oxen and Goats, although present in most of the Sheep. More important is the circumstance that the bony cores supporting the horns of the Antelopes are nearly always solid throughout, whereas those of the other three groups are extensively hollowed internally. An important distinction between the Oxen (*Bovinae*) on the one hand and the Sheep and Goats (*Caprinae*) on the other is to be found in the structure of the upper molar teeth, those of the former being nearly square in section, whereas those of the latter are oblong. Among the Antelopes, both these types are to be met with, the Gemsbok and Sable Antelope group having Ox-like molars, whereas those of the Gazelles, Hartebeests, and Gnus are of the Goat-like form. Moreover, certain Antelopes, such as Eland and Kudu, have a third type of molar structure; the crowns of these teeth are short—instead of tall—and thus resemble those of some of the Deer. These differences alone are sufficient to show that Antelopes in no sense form a single zoological group, but that they comprise a number of distinct groups which for many purposes it is convenient to brigade together under a common designation. Consequently it will be manifest that no further attempt at a definition of the assemblage can be made.

Exclusive of the Goat-like group, these animals may be divided into the following seven sections, or sub-families, viz.:—(1) *Bubalinae,* Hartebeests and Gnus; (2) *Cephalophinae,* Duikers and Four-horned Antelope; (3) *Neotraginae,* Dik-diks, Steinboks, Grysbok, &c., (4) *Cervicaprinae,* Rhebok, Waterbuck, Rietbok, &c.; (5) *Antilopinae*, Pallas, Saiga, Chiru, Gazelles, &c.; (6) *Hippotraginae*, Sable Antelope Oryx, Addax, and their allies; (7) *Tragelaphinae*, Nilgai, Harnessed Antelopes, Kudu, and Eland.

The whole of the numerous Antelopes comprised in these seven groups are exclusively confined to the Old World, while the great majority are restricted to Africa south of the northern tropic, or at least to Africa with Syria and Arabia. The first section, for instance, has no representatives beyond the countries named, and it is indeed only one species of Hartebeest that is even found beyond Africa, the Gnus being restricted to those portions of that continent lying south of the northern tropic. In the second section, the Four-horned Antelope is Indian, whereas all the numerous species of Duikers (*Cephalophus*) are restricted to Africa south of the Sahara. The members of the third section—all of which are small-sized creatures—are absolutely confined to the area last named; and none of the fourth section (*Cervicaprinae*) extend their range beyond the same limits. Skipping section (5), it will be found that most of the members of the *Hippotraginae* inhabit Ethiopian Africa (as that part of the continent lying to the south of the northern tropic is called), although the Addax is found in Northern Africa and Arabia, and the Beatrix Antelope (*Oryx beatrix*) inhabits the latter country, and is said, indeed, to range as far as Bushire. Both the groups enjoying this wider range are desert-haunting forms. In the sixth section, the Nilgai (*Boselaphus*) alone is Indian, all the other forms being Ethiopian. Reverting to the fifth section, or *Antilopinae*, we find this the most widely spread of all, most of its representatives being inhabitants of more or less desert districts. Indeed, the only exclusively Ethiopian genus in this group is the one containing the Pallas (*Aepyceros*). Of the others, the one species of *Saiga* is confined to the steppes of Central Asia, the Chiru, which alone represents *Pantholops*, inhabits the highlands of Tibet, while the Blackbuck, forming the sole member of the now restricted genus *Antilope*, has its home on the plains of India. Of the Gazelles, the typical genus *Gazella* has the widest distribution of all the Antelopes, ranging from South Africa (where it is represented by the Springbok) through the eastern and northern districts of the same continent, to Syria, Arabia, Asia Minor, Persia, Baluchistan, northern India, Afghanistan, and Mongolia. Probably this wide distribution is to be accounted for by the desert-frequenting habits of most Gazelles, which has enabled them to traverse districts impassable to the majority of their kindred. The more aberrant Gazelles, such as the Gerenuk (*Lithocranius*), Clarke's Antelope (*Ammodorcas*), and the smaller Beira (*Dorcatragus*), are, however, exclusively confined to Eastern Ethiopia.

It will thus be apparent that by far the great majority of Antelopes are Ethiopian (including in this designation part of Arabia), and indeed, with the exception of the Gazelles, the only true Antelopes found elsewhere than Africa, Syria, and Arabia, are the Indian Four-horned Antelope, Blackbuck, and Nilgai, the Tartarian Saiga, and the Tibetan Chiru. Most noteworthy is the circumstance that no true Antelopes are to be found in the countries lying to the eastward of the Bay of Bengal; although Goat-like Antelopes of the genera *Cemas* and *Nemorhaedus* range into Burma, China, Japan, &c.

BLACKBUCK.
Ht. at shoulder, 32 *in.* *Av. horn meas.* 22 *in.*
Max. horn meas. 40½ *in.*

Ethiopian Africa thus being pre-eminently the headquarters of the true Antelopes, it is curious to find that at no very distant epoch of the earth's history many extinct species closely allied to modern African types inhabited India, Persia, Greece, and Hungary. Hence it is evident that there has been a great southern migration of the Antelopes; while it is probable that the entrance of the group into Africa is a comparatively recent event. Possibly the original northern forms may have been suited only to a comparatively dry climate, which would account for their never having been able to effect an entrance into the

Malayan countries; but it is extremely difficult to discover any adequate reason for the extinction in India of nearly all its original inhabitants belonging to this group.

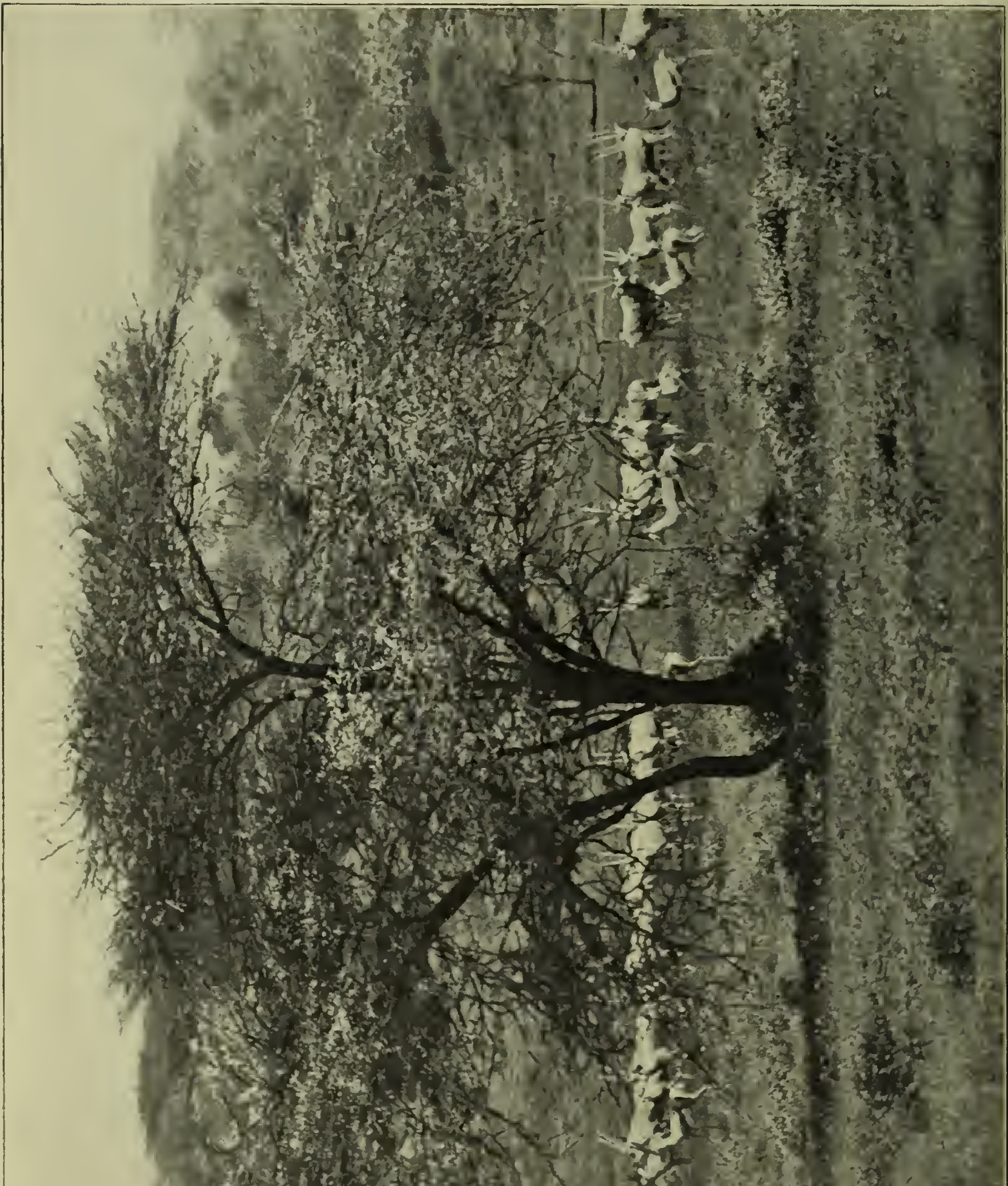
Be this as it may, it is evident that when the original migrants from the north (which were probably comparatively few in species) succeeded in establishing themselves in Ethiopian Africa, they found a country so eminently suited to their requirements, that they increased, alike in number and in the development of generic and specific types, in a manner unparalleled in any other part of the world. Although it is quite probable that Antelopes were originally inhabitants of open and comparatively dry districts, their Ethiopian descendants have developed the capacity of adapting themselves to stations of every kind. Whereas the Gemsbok and other members of the genus *Oryx*, together with the Gazelles, and many of the Hartebeests, are still inhabitants of open and more or less desert districts, the Waterbuck, Lechiwe, and other species of *Cobus*, as well as the Sitatunga and others of the Harnessed Antelopes (*Tragelaphus*), delight to dwell among the reeds fringing the banks of rivers and swamps, or even to stand neck-deep in the water of lakes. Some members of the latter group inhabit the steaming tropical forests of the Congo valley, and in Senegambia it seems not improbable that the Derbian Eland is a forest animal. Not only are the plains tenanted by their special denizens, but the mountains have been invaded by forms like the Klipspringer and Rhebok, which rival, or excel, the Chamois in their jumping powers. Structural peculiarities have accompanied their adaptations, the Klipspringer having its hoofs short and rounded like those of a Goat, whereas those of the Sitatunga are enormously elongated. As regards food, too, Antelopes seem capable of great adaptations; since whereas most kinds live on grass, a Steinbok inhabiting two small islands near Zanzibar lives entirely on leaves and twigs.

At the present day, Africa is undoubtedly the paradise of Antelopes, but it is very doubtful if this would ever have been the case had Deer succeeded in penetrating south of the Sahara. Why Antelopes reached Ethiopia, while Deer were kept out, we shall probably never know.

R. LYDEKKER.

ANTELOPE SHOOTING. **Europe and Asia.**—Antelope shooting in various forms is to be obtained in many parts of the world, but it may be said with truth that the natural home of this family lies in Africa, and especially in **South and East Africa.** Here, magnificent sport is still to be had with antelopes ranging in size from the Eland, whose stature exceeds that of a stall-fed ox, down to the tiny Blue Buck, which is scarcely larger than a good hare. In Europe, the chase of the Chamois, which is stalked or driven among the difficult mountains of the Alps, is well known. In the Caucasus and Mongolia, the wary **Djerán** (*Gazella gutturosa*) is occasionally stalked, but more often coursed with greyhounds upon the great steppes. The curious **Saiga** (*Saiga tartarica*), with its hideous swollen-looking nose, is a denizen of South Russia and the Central Asian steppes; it is nowhere abundant, and has seldom fallen to the rifles of English sportsmen. The **Tibetan antelope** (*Pantholops hodgsoni*) is another rare species, hitherto seldom obtained by Europeans, found among hills and valleys beyond the northern frontiers of India and in Turkestan. It carries handsome horns, strongly annulated; the best measurement hitherto obtained is 27¾ inches. In India itself, the well-known **Blackbuck** (*Antilope cervicapra*), whose characteristic horns are perhaps more familiar than those of any of the smaller antelopes in European collections, is to be found, often in large numbers, in suitable localities from the north to the south of the country, on wide, open plains or in grassy places near the banks of rivers. Among English sportsmen it is almost invariably pursued by stalking, and affords excellent sport. The natives hunt it occasionally with the Cheetah, and at other times stalk it by aid of trained bullocks or with a bullock cart. The average weight of a Blackbuck is about 85 lbs.; the longest horn measurement hitherto recorded 30½ inches—straight measurement. The **Nilgai** (*Boselaphus tragocamelus*), which is now usually included among the tragelaphine group of antelopes, is a large and somewhat odd-looking beast, found in level country varied by bush and light jungle, in many parts of India. As beasts of chase Nilgai are not looked upon with much favour; they can be pretty easily shot, and natives in many localities have a strong prejudice against their being destroyed.

A good blue-bull, as the male of the Nilgai is called, stands from 4 feet 4 inches to 4 feet 8 inches at the shoulder. The horns are short and ox-like, and the best recorded measurement is 9⅞ inches. The **Four-horned** Antelope, or **Charsingha** (*Tetraceros quadricornis*), is found sparingly in many parts of India in bush, jungle, and grassy covert. It is a small antelope.



[Photo. by A. Radclyffe Dugmore.

HERD OF ORYX (BEISA) AND GRANT'S GAZELLE DURING THE NOONDAY REST.

and lies very close in covert, and is more often than not snapped with the shot gun, as are the smaller bush-loving antelopes of Africa.

RAVINE DEER.

Ht. at shoulder, 26 *in.* *Av. horn meas.* 9 *in.* *Max. horn meas.* 14¼ *in.*

The **Indian Gazelle**, or **Chinkara**, commonly known as the **Ravine deer** (*Gazella bennetti*), is found in ravines and among rocky hills and scrub in many parts of India, Beluchistan, and Southern Persia. It carries nice horns, measuring from 10 to rather more than 15 inches in length, and, although shy and wary, can be stalked successfully by the careful gunner. Camels and shooting-horses are occasionally employed to aid the sportsman in his operations with this antelope. The **Tibetan Ravine deer** (*Gazella picticaudata*), found in Mongolia and Western Tibet, is an animal strongly resembling the last-named species, and of much the same habits.

Among Indian antelopes, one can scarcely pass over the mountain-loving **Goral**, or Himalayan Chamois (*Urotragus goral*), and the Himalayan **Serow** (*Nemorhœdus bubalinus*), goat-like antelopes, which afford excellent mountain stalking. Closely allied to the last-named is the Serow of Sumatra (*N. sumatrensis*), found, as its name implies, among the hills of Sumatra, as well as on the mainland.

Gazelle Stalking.—The true desert-loving gazelles, which include many species, enjoy a wide range from Persia and Central Asia to Arabia and North Africa. Chief among these may be named the Dorcas, Atlas, Arabian, Persian, Isabella, and Sœmmering's gazelles; *Gazella dama, G. rubifrons,* and the Addra gazelle. Speke's gazelle (*G. spekei*), found in Somaliland, is remarkable for a curious bulging skin formation upon the nose, which easily distinguishes it. The Somali lowland gazelle (*G. pelzelni*) bears a strong resemblance to

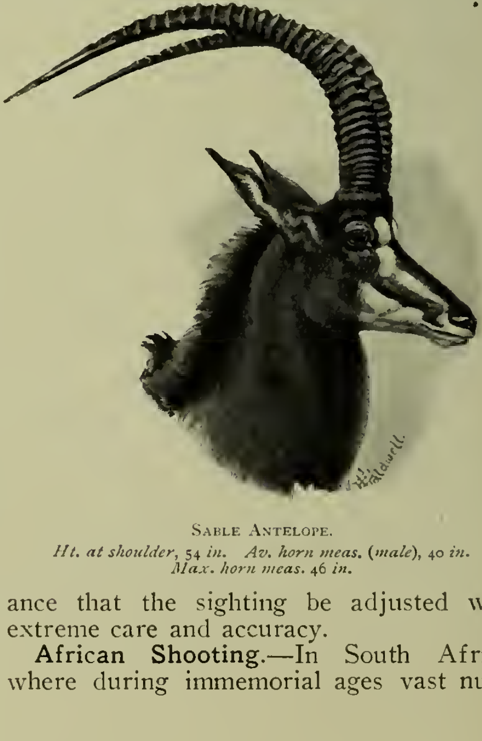
[*Photo. by A. Radclyffe Dugmore.*

GRANT'S GAZELLE.

[*Photo. by A. Radclyffe Dugmore.*

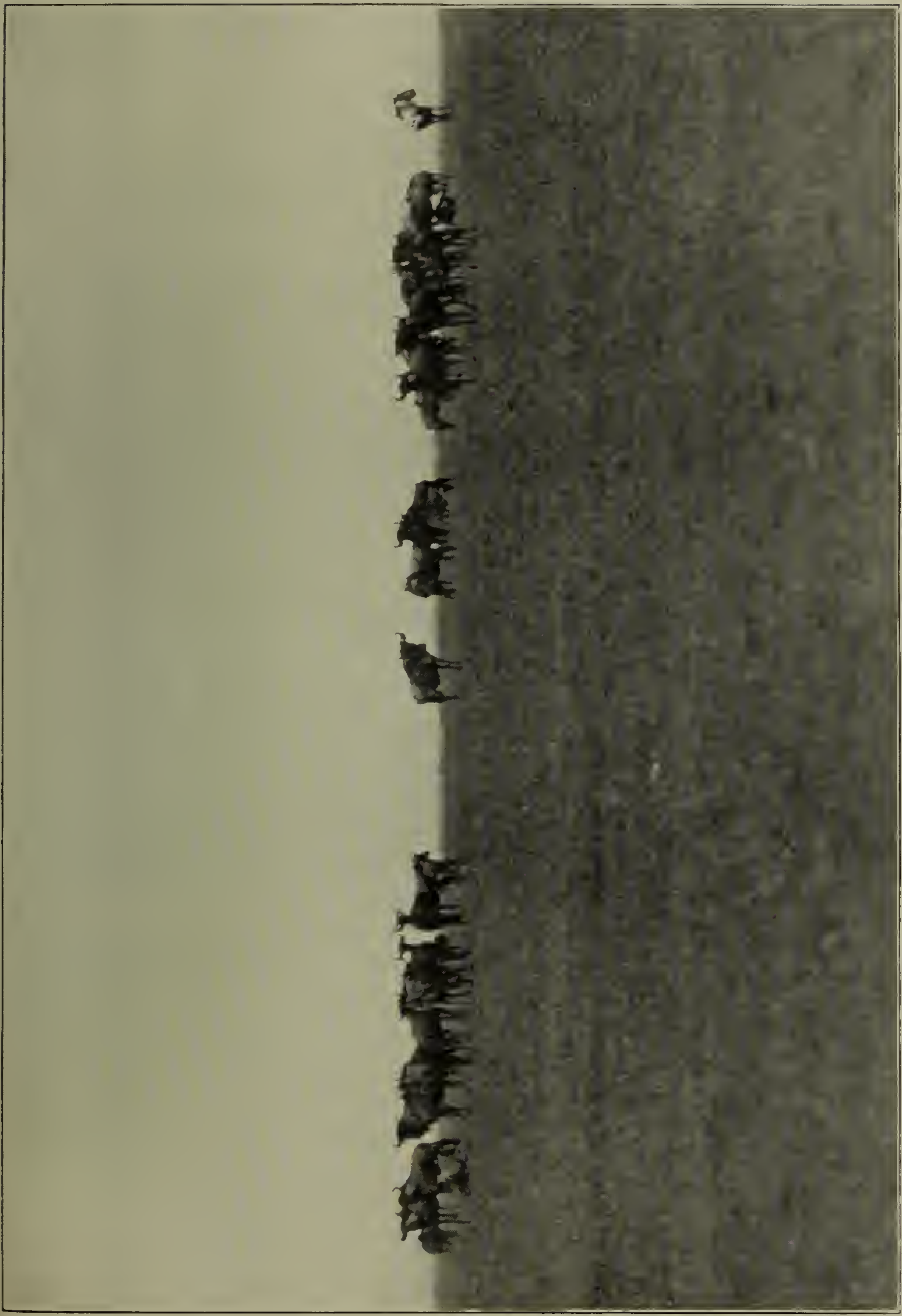
HERD OF ELAND ON THE NORTHERN SLOPES OF MOUNT KENIA.

the last-named, but lacks the nasal peculiarity. Grant's gazelle, carrying very beautiful horns extending to 30 inches in length; Clarke's gazelle, remarkable for its long, slender, giraffe-like neck; and Thomson's and Waller's gazelles are all very handsome forms, discovered in East and North-East Africa within recent years. All these gazelles are only to be stalked and secured at somewhat long ranges by accurate rifle-shooting. Some of them, in countries where they have been much shot at, are almost unapproachable. Occasionally patches of bush or isolated thorn trees may be made use of in approaching these wary plain-dwellers, but it must be admitted that, as a rule, stalking gazelles upon open flats, under a burning sun, is extremely trying work for the sportsman. By the aid of natives, it is sometimes possible to conduct driving operations, and to push the game within shot of the gunner lying concealed; and occasionally the old South African Bushman plan is resorted to, and, arrayed as an ostrich, the European sportsman is enabled to get right among troops of gazelle and other game and shoot what he requires. This last is an exceedingly deadly method, but the gunner has first to obtain a complete skin, head, and neck of an ostrich, and great care has to be exercised in approaching in a natural and ostrich-like manner and in taking advantage of the wind, which, if blowing from the direction of the stalker, would at once betray him. For gazelle shooting, a ·303 or other small-bore rifle is the best weapon that can be employed, and as few shots are obtained at less than 200 yards, it is a matter of vital importance that the sighting be adjusted with extreme care and accuracy.



SABLE ANTELOPE.
Ht. at shoulder, 54 *in.* *Av. horn meas.* (*male*), 40 *in.*
Max. horn meas. 46 *in.*

African Shooting.—In South Africa, where during immemorial ages vast num-



[Photo. by A. Radclyffe Dugmore.

WILDEBEEST OR BRINDLED GNU.

bers of antelopes of many and remarkable species must have wandered and fed in undisturbed possession, much of the game has, as in other parts of the world, been shot off. Yet much still remains. South of the Zambesi, some thirty species of antelope are still to be found; many of them near the southern littoral, others in far remote places where they are difficult of access. The **Eland,** the largest antelope in the world [*see* ELAND], is now somewhat scarce in South Africa. The **Sable** and **Roan** antelopes (*Hippotragus niger* and *H. equinus*), two of the most magnificent forms in the African Continent, are to be met with in North Matabeleland, Mashonaland, and thence to the East Coast, sparingly in Khama's country, and thence northward beyond the Zambesi. One of the great advantages of hunting in South Africa—although it is, too, answerable for much of the rapid disappearance of the fauna—is the fact that horses can be always, or nearly always, employed (except towards the East Coast, where the Tse-Tse fly abounds) in pursuing the larger antelopes and heavy game. Various types of rifle are now used for antelope shooting. For the heavier animals, such as eland, kudu, and sable and roan antelopes, a ·400 rifle, with cordite or axite powder, is an excellent weapon. But the ·303, Mauser, Mannlicher, and other small-bore rifles, are also very favourite weapons for antelope and gazelle shooting. The sable and roan antelopes are usually found in semi-bushy country, or among the lower slopes of hills and kopjes. Sables run in troops of from a dozen to fifty; Roan antelopes in small bands of from six to fourteen. Both of these great antelopes are possessed of considerable speed and staying power, although they can occasionally be run down on horseback. The magnificent horns of the Sable antelope, scimitar-shaped and strongly annulated, form one of the greatest prizes of the hunter in South Africa. The Roan antelope has horns of a somewhat similar character, but shorter and thicker in growth. It ought to be remembered in approaching wounded individuals of these antelopes, that both are extremely savage, and, unless completely disabled, will charge desperately. Many a good dog has been killed by the deadly sweep of a Sable or Roan antelope's horns. A good Sable antelope bull will stand 4 ft. 6 in. at the withers and carry horns measuring from 45 to 50 in. over the curve. A Roan antelope averages two or three inches more in height, but bears horns which lack the magnificent sweep of the Sable's and seldom exceed 32 inches over the curve.

[*Photo. by A. Radclyffe Dugmore.*

HERD OF COKE'S HARTEBEEST COMING TO DRINK.

It should be borne in mind, in shooting

antelopes, and especially the larger African antelopes, that they are possessed of immense vitality, and will often run clean away from the hunter after having received wounds that to the casual observer would inevitably signify immediate collapse. Even with a bullet through the heart or lungs, an antelope will succeed sometimes in making good its escape. The writer has spoored for miles a blue wildebeest bull, which had been shot clean through the lung with a Martini-Henry bullet, and then had to abandon the pursuit to a Bushman tracker. As few Europeans, unless they have spent many years in the pursuit of great game, are equal to the science of spooring, it is necessary to have at hand a native or two, preferably Bushmen if they can be obtained, who will find and track game and will take up the spoor of animals when wounded. Many a good head of game has been lost for want of a native spoorer.

The **Kudu,** one of the biggest and noblest of the African Antelopes, is noticed elsewhere [*see* KUDU], as are the **Gemsbuck, Beisa, Leucoryx** [*see* ORYX] and the black and blue **Wildebeest** [*see* GNU]. The **Hartebeest** is one of the most characteristic of the Ethiopian group of Antelopes, and is represented in South Africa by the Cape hartebeest (*Bubalis caama*) and Lichtenstein's hartebeest (*B. lichtensteini*). In East and North-East Africa are to be found Jackson's hartebeest (*B. jacksoni*), the Tora hartebeest (*B. tora*), Swayne's hartebeest (*B. swaynei*), Coke's hartebeest (*B. cokei*), Neumann's hartebeest (*B. neumanni*), Niedieck's hartebeest (*B. niediecki*), and the Senegal or Korrigum hartebeest (*B. senegalensis*), represented in Central and East Africa by closely allied races, the Tiang and Topi. Besides these forms we have the West African hartebeest (*B. major*), which is only met with in West Africa, and the Bubal hartebeest (*B. boselaphus*), found in North Africa and Arabia. All these hartebeests have a strong family resemblance, although there are slight differences in colour, habits, and the shape of the horns. They are all characterised by speed, staying powers, and vitality, so that even when severely wounded they will not unfrequently make good their escape. It is useless attempting to run down a hartebeest, or its near cousin the Tsesseby, in tail-on-end chase. Such an attempt is sufficient to break the heart of the stoutest horse, and, indeed, the writer has seen a good African shooting pony which succumbed from nothing but the effects of a desperate gallop

[*Photo. by A. Radclyffe Dugmore.*

HERD OF HARTEBEEST ON THE DRY BED OF THE OLGUI RIVER.

after hartebeest. The Cape hartebeest—often called by the Boers the Rooi (or red) hartebeest—stands about 4 feet at the withers, and has, like most of its kin, very drooping quarters. Its colour is of a reddish-brown, darker upon the back, shoulders, and fore legs. The face is black and extremely long, giving the animal a quaint, old-fashioned expression, while the rugged horns are perched upon an extremely high frontal bone. It is still common in Bechuanaland, the Kalahari, Great Namaqualand, and about the Botletli River, in Ngamiland. It runs in good sized troops, varying from twelve or fifteen to fifty and occasionally even more. It is found indifferently in open, park-like forest country, or upon grassy plains.

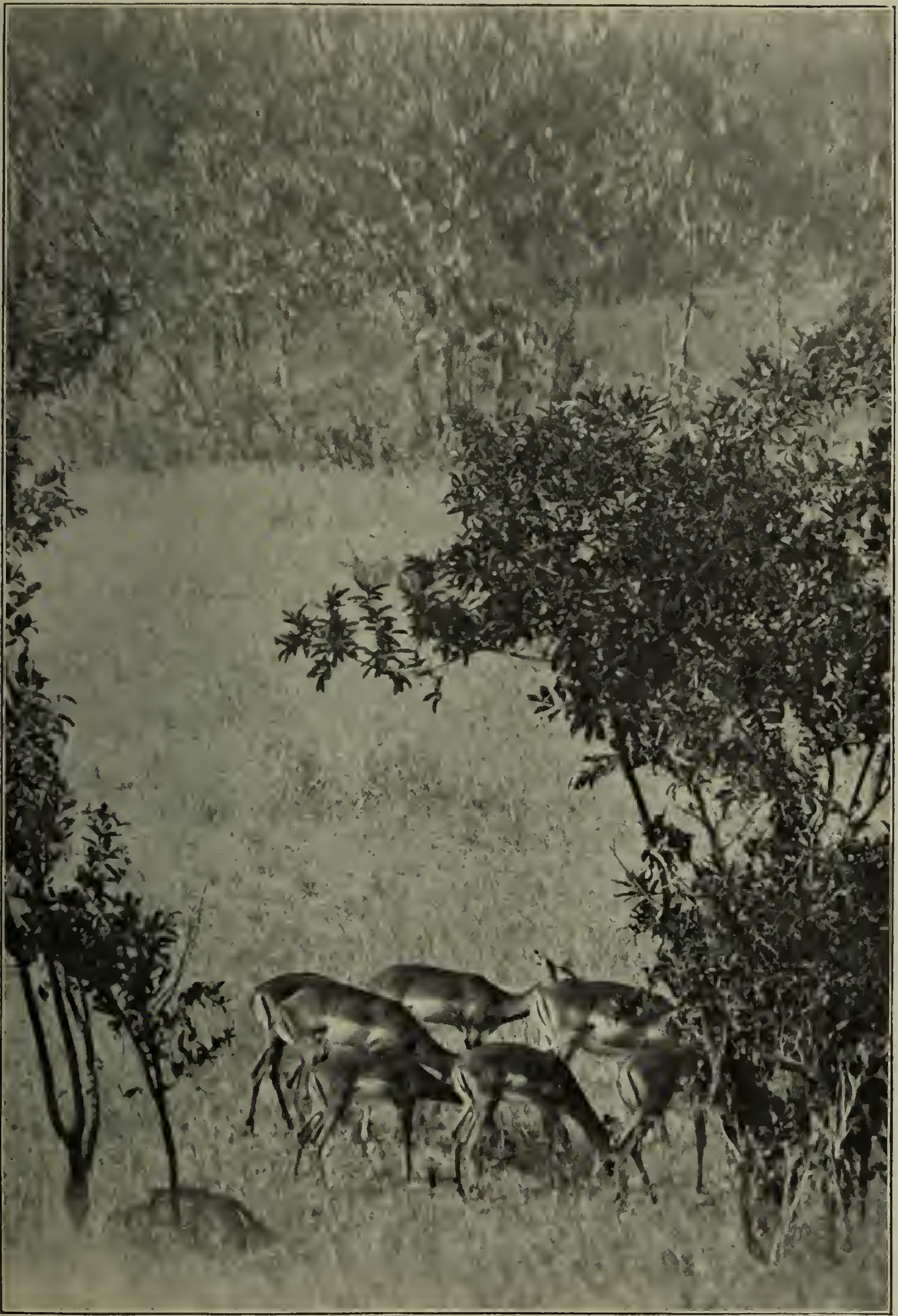
[Photo. by A. Radclyffe Dugmore.

Coke's Hartebeest at Kamite. This Picture will give some idea of the Abundance of the Game in British East Africa

These animals, although shy and suspicious, are yet occasionally very stupid. They have a habit of wheeling round and halting in the middle of a run and the mounted hunter can thus often dismount and obtain a fair shot. They are obstinate, too, in sticking to a particular line of flight, and the writer has more than once cut a troop in half in this way and secured an easy shot. They can be turned from their course, as can other South African antelopes, by firing a bullet or two over their heads so as to strike the ground in front of them; and if the leader of the troop can be wounded and turned out, the rest will often become bewildered and afford easy shooting. If it were not for these weak points, the hartebeest would be one of the most difficult of all animals to bring to bag. As it is, it is by no means one of the easiest. Lichtenstein's hartebeest is found in Mashonaland, Gazaland, Portuguese South-East Africa, and thence northward into East Africa. Its habits are very similar to those of *Bubalis caama*.

The **Tsesseby** (*Damaliscus lunatus*) is a handsome antelope, averaging in height close on four feet, nearly related to the hartebeest and greatly resembling that antelope in appearance and colouring. The horns, which are crescent shaped, differ, however, a good deal from those of the Cape hartebeest. At the present day the Tsesseby is most plentiful in Mashonaland, Ngamiland, and in South-East Africa between the Pungwe and Zambesi rivers. It is the swiftest and most enduring of all antelopes, which is saying a good deal; yet, thanks to the characteristics which have been pointed out in the case of its near congener the hartebeest, it is often brought to bag. **Hunters' Antelope** (*Damaliscus hunteri*) is a species lately discovered in East Africa, also related to the hartebeest. The horns are, however, much more prolonged and extend in length to 26¼ inches. Up to the present this antelope has been chiefly found on the Tana River in East Africa.

An extremely interesting group of animals to the sportsman are the water-loving antelopes, which include the **Lechwe** (*Cobus leché*), the **Puku** (*C. vardoni*), the **Sitatunga**, or Speke's antelope (*Tragelaphus spekei*), the **Inyala** (*T. angasi*), the **Reedbuck** (*Cervicapra arundineum*), **Penrice's Waterbuck** (*Cobus penricei*), and the **True Waterbuck** (*C. ellipsiprymnus*), all of which are found in South or South Central Africa. The **Sing-Sing** (*C. de-*



[*Photo. by A. Radclyffe Dugmore.*

HERD OF IMPALA FEEDING

WATERBUCK.
Ht. at shoulder, 48 *in.* *Av. horn meas.* 20 *in.*
Max. horn meas. 33½ *in.*

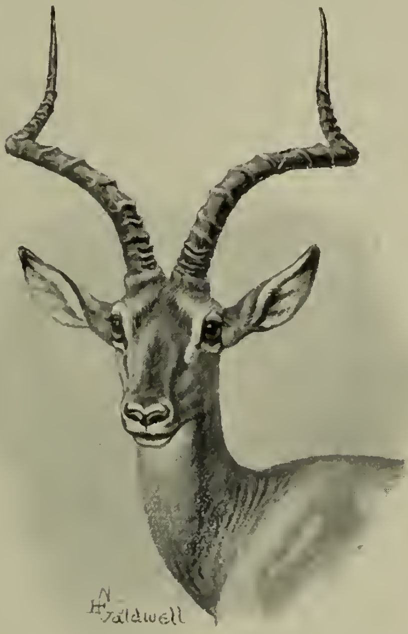
fassa) is an East African form of the large waterbuck, while the White-eared Kob (*C. leucotis*), Mrs. Gray's Kob, and Vaughan's Kob are found in the White Nile and Bahr El Ghazal regions. Other forms of waterbuck, such as Buffon's Kob, the Uganda Kob, Crawshay's, and the Abyssinian and Western Defassa, are found in Central, Eastern, and Western Africa. Of these animals, the True Waterbuck, the Lechwe, the Reedbuck, and the Sing-Sing are best known to hunters. The Puku is scarce and restricted as to habitat, while the Sitatunga, although flourishing in large numbers in the swamps and reedbeds of the river systems of the interior, is extremely difficult of approach and seldom falls to the rifle. In South Africa, the Waterbuck, the Lechwe, and the Reedbuck all afford excellent rifle-shooting on the river systems beyond the Vaal. Penrice's Waterbuck, a new species, has only lately been discovered by Mr. G. Penrice in the country behind Benguela, Portuguese West Africa. It is a handsome antelope, differing only slightly from the Sing-Sing and the South African Waterbuck. The Inyala, a form between the Bushbuck and the Kudu, frequents heavily bushed country near the rivers and swamps of South-East Africa, and is extremely local. It may still be found in the neighbourhood of Delagoa Bay, and is well worthy of the hunter's labours. It is found also in Nyasaland, and has been reported in Angola, Portuguese West Africa.

[*Photo. by A. Radclyffe Dugmore.*

THE COMMON WATERBUCK, NEAR THE KANA RIVER.

The **Impala**, or **Pallah** (*Aepyceros melampus*), is an extremely elegant antelope, bearing peculiarly characteristic horns, which differ from most other species; it is to be met with in considerable troops from the Limpopo River northwards into East and Central Africa, in bushy and forest country, upon the borders of such of the river systems as are not surrounded by swamps. Where it has not been much disturbed, the beautiful Impala roams in large numbers, as many as eighty or a hundred in a troop. Thanks to the nature of its habitat, where covert is abundant, it is not a difficult antelope to shoot. In height the Pallah stands slightly under three feet, while representative horns range from twenty to thirty inches over the curve.

Three small antelopes which give very excellent mountain shooting in South Africa are the **Klipspringer** (*Oreotragus saltator*), the **Vaal,** or **Grey, Rhebok** (*Pelea capreola*), and the **Red Rhebok,** or **Mountain Reedbuck** (*Cervicapra lalandi*). These antelopes frequent many of the mountain ranges of South Africa, and afford admirable shooting with the rifle. The **Klipspringer** is found as far north as Abyssinia. It is a very charming and astonishingly active little mountaineer, and well deserves its title, "Chamois of Africa."



IMPALA.
Ht. at shoulder, 36 *in*. *Av. horn meas.* 20 *in*.
Max. horn meas. 27½ *in*.

[*Photo. by A. Radclyffe Dugmore.*

IMPALA JUMPING. THIS PECULIAR HABIT IS CHARACTERISTIC OF THESE ANIMALS WHEN FRIGHTENED.

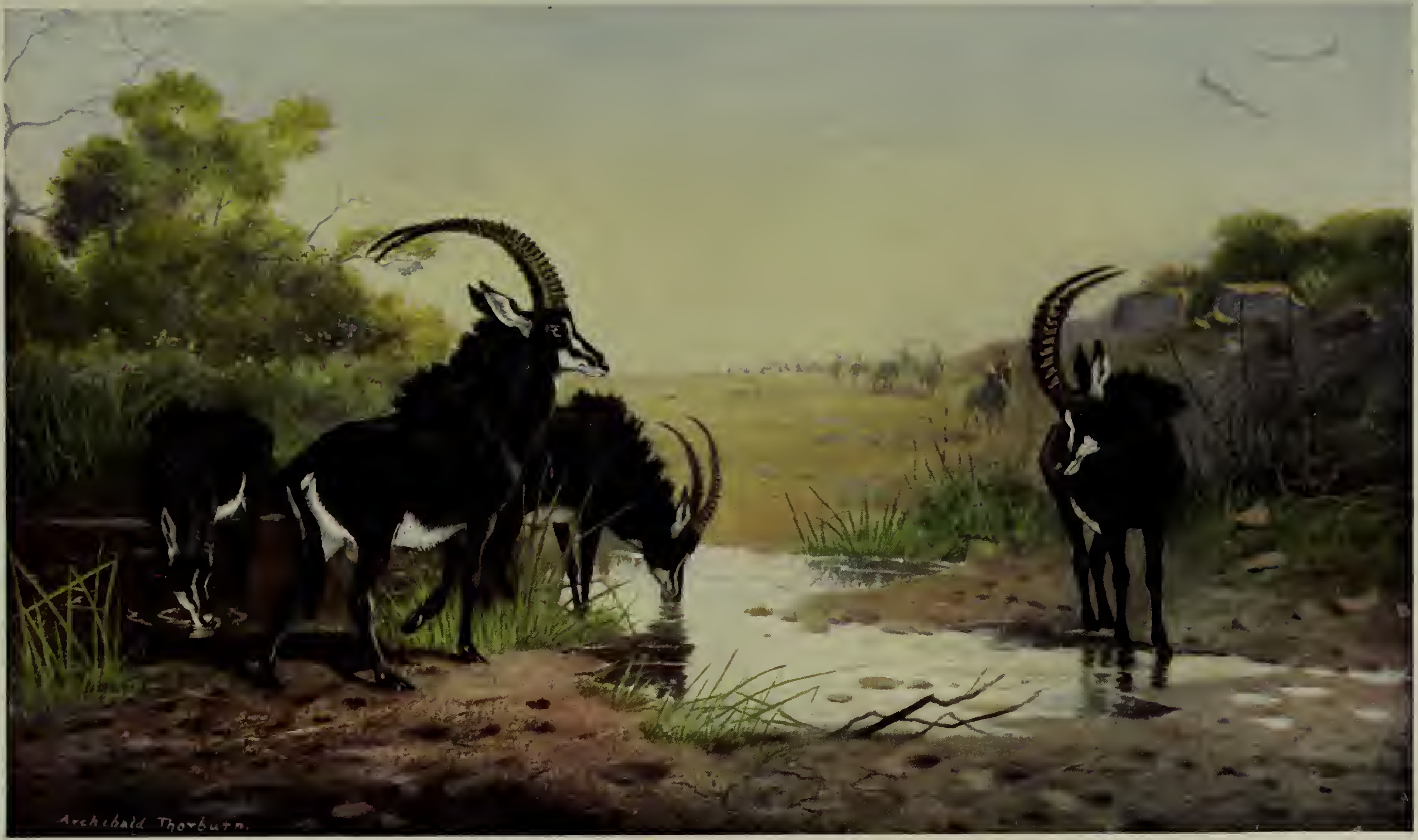
The well-known **Springbuck** (*Antidorcas euchore*) is happily still abundant in many parts of South Africa, from the Karroos of Cape Colony to Ngamiland, and even Benguela on the West Coast. This fleet, active, and characteristic antelope affords some of the best stalking in South Africa. It can be driven by approaching in line *downwind*, when it invariably takes upwind and can be cut off by gunners mounted or in carts; or it can be quietly approached by slowly walking a horse until within four hundred yards and then dismounting and sidling in for a shot. Very accurate shooting is, however, required for the springbuck, which is seldom bagged nowadays at less than three hundred yards range. The **Blesbok** and **Bontebok** (*Damalis albifrons* and *D. pygargus*) are two very handsome and remarkable antelopes, which formerly thronged the plains of South Africa, but are now only to be found preserved on a few farms. As game animals they may be considered, unfortunately, almost extinct.

Addax (*Addax nasomaculatus*).—The rare and singular antelope, known to the tribes of North Africa as *Kubbaji*, is an inhabitant of the waterless and desert regions of southern Tunisia, Algeria, and Morocco, and of the Sahara and the Egyptian Sudan. Up to the present time very few specimens have been shot by Europeans. The Addax is a good-sized antelope, not distantly related to the oryxes, and having some points of resemblance to the sable and roan antelopes. The horns have something of the spiral twist of the kudu; they are strongly annulated, or ringed, and in good specimens run to close on 40 inches in length. This is a heavily built antelope, standing 3 ft. 6 in. at the shoulder, and having a sandy or yellowish-white coloration (greyish in winter), with whitish rump, underparts, and limbs. On the forehead is a patch of brown hair, and below the eyes are white streaks, forming a chevron. There are also white markings on the ears and lips. In winter the coat of this antelope becomes much heavier, and masses of long, brownish hair are developed on the neck, shoulders, and forehead. The hoofs, which are singularly wide and flat, show a remarkable adaptation for desert life, and, living as this animal does usually in loose, sandy desert tracts, its wide, shallow feet are as useful to it as are the somewhat similarly shaped hoofs of the reindeer, which spends much of its life in a snow-covered habitat. Males and females alike carry horns, and, as with the oryxes, the horns of the females are as long as, or longer than, those of the males. The addax is nearly always found in bare, open country, and appears to be able to withstand the direct rays of a powerful sun as easily as do the gemsbuck, the springbuck, and other desert-loving antelopes and gazelles. In North Africa the Arabs of Tunisia hunt this antelope with their long-haired *slughi* hounds—a kind of greyhound—themselves following the chase on horseback. The record pair of Addax horns, which are the property of Sir Edmund Loder, measure $39\frac{5}{16}$ in. over the curve.

The **Bushbucks** (*Tragelaphus*), **Steinbuck** (*Nanotragus campestris*), **Oribi** (*N. scoparia*), **Grysbuck** (*N. melanotis*), **Duiker** (*Cephalophus grimmi*), **Natal Redbuck** (*C. natalensis*), and **Bluebuck** (*C. monticola*) are small antelopes, which in many parts of Africa are to be obtained, principally amid bush and thickets, or, in the case of the Steinbuck and Oribi, on grassy plains. As a rule, most of these antelopes fall to the shot gun. They are often bagged when the gunner is in pursuit of feathered game. In the thick bush fringing the littoral of Cape Colony, big drives are organised, in which large numbers of bushbuck and bluebuck are secured. The **Harnessed Bushbuck** (*Tragelaphus scriptus*), a very beautiful form of bushbuck, is found upon the banks of the river systems of South-Central, East, and West Africa, from the Limpopo northwards, and is a prize that any sportsman may well be proud of. The **Dik-Diks**, of which eleven species are already known to sportsmen, are tiny antelopes, standing for the most part no more than 14 inches at the shoulder, and found chiefly in East and Central Africa. Several species have been met with in Somaliland, while one, the Damara Dik-Dik, has been found as far south as German South-West Africa. These little creatures are distinguished by curiously long noses, rudimentary tails, and a tuft of long hair on the crown of the head. As they are no bigger than hares, they are best secured with a shot-gun.

ROCKY MOUNTAIN GOAT.
Ht. at shoulder, $35\frac{7}{8}$ *in.* *Av. horn meas.* (*male*) 8 *in.*
Max. horn meas. $11\frac{1}{2}$ *in.*

North America.—Turning to North America we find but two antelopes to make note of. Of these, the well-known **Pronghorn** (*Antilocapra americana*) has become so scarce as to be now hardly accessible as a beast of chase; while the singular **Rocky Mountain Goat** (*Haplocros montanus*), an excellent quarry for those fond of the most arduous and difficult mountain shooting,


Archibald Thorburn.

After Archibald Thorburn.

SABLE ANTELOPE.

may be classed among the goats almost as much as among the antelopes. Perhaps the best ground at the present day for Rocky Mountain goat is amid the snow- and ice-covered ranges of Alaska.

H. A. BRYDEN.

ANTELOPE COURSING.—The common Indian Antelope (*Antilope cervicapra*) is so fleet of foot, that it is ordinarily held to be useless to slip greyhounds after it. Even two greyhounds held in leash, the second to take up the running when the first was distressed, have been known to be successively exhausted by one antelope with apparent ease, aided though they were by two riders similarly riding alternately. On soft ground, however, after rain, the pointed hoofs of the antelope sink, so that a single greyhound will pull down the fleetest of them. Aware of this, the antelope, if surprised among cultivation, where the fields are divided by ridges, will keep to the hard dry ridges, however rectangular, never cutting a corner across the plough, though the hound be within a stride, and therein shows its wisdom, for it often makes good its escape. But even on hard ground, a fawn well selected from the herd by a practised eye as young enough may be run down if well ridden to. When the herd see the hounds closing up to a fawn, they circle round and cut in between the fawn and the hounds, and dally with them to lead them off. Then the riders must be close up, so as to be able to call off the hounds and lay them on to the fawn again. The herd will repeat the manœuvre again and again. A fawn so young that it had milk in its stomach took a field of well-mounted men with five deerhounds ten miles at such speed that all the hounds were exhausted, and all the horses but two, which only continued the chase by being ridden and saved alternately.

ANTELOPE SNARING.—In India antelope snaring is practised in the rutting season after the following method. A tame buck antelope, his horns dressed with nooses, is led in sight of the herd. His instinct prompts him to join the does, a move resented by the black buck of the herd. A fierce combat ensues, in the course of which the horns may become so entangled, that both eventually fall exhausted, and in such plight are easily secured.

ARCHERY.—The practice of Archery can be traced back to very ancient times, though authorities differ as to when the use of the bow first became common in England. The many statutes for the encouragement and directing of the practice of archery, the provisions made by them that practically every one should be skilled in the use of the bow, are sufficient evidence of the value which our ancestors placed upon it before "villanous saltpetre" ousted it from the proud position of our national weapon. After fire-arms had taken the place of the bow in war, the practice of archery appears in a great measure to have died out, though it still existed in the north of England, and up to about 1760 in the Finsbury fields.

The revival of archery as a pastime can be traced to 1780, when Mr. Waring, the Secretary or Manager of the Museum belonging to Sir Ashton Lever at Leicester House, took it up. Finding that it improved his health, he persuaded Sir Ashton Lever to try it. He did so, and, fascinated by it, with the assistance of his friends founded in 1781 the Royal Toxophilite Society, which, from that time to the present day, has maintained its position at the head of the sport. Patronised and practised by the Prince of Wales and other Royal Dukes, archery at once sprang into popularity, and numerous Societies were founded, which flourished till the stern reality of war gave people little time to practise the peaceable sport of the bow. On the conclusion of peace, it was again warmly taken up, old Societies were revived, new ones were started all over the country, and in 1844 the first Grand National Archery Meeting took place at York. At the present time, there are numerous Societies all over England, and the five public meetings held annually show the popularity of the sport.

Of the pleasures of archery and the facilities which it affords to both ladies and gentlemen for physical and graceful exercise there can be no doubt, and its fascination is well known to all who shoot. Unfortunately it has the drawback of being difficult, and without regular practice and a knowledge of how to do it, it is not easy to excel, this however in the eyes of its votaries being one of its principal charms.

The object of this article is to give instruction which will assist beginners to commence shooting in the correct way, a great obstacle to success being the assumption of wrong methods at first, faults being thus established which it is difficult afterwards to eradicate. Many books of instructions on the subject have been written, commencing with Ascham's *Toxophilus* in 1545, down to the present day, good, bad, and indifferent. It is therefore impossible to write a new essay on archery without repeating much of what has been already said by the writers who come under the first category, notably Messrs. Roberts,[1] Ford,[2] Butt,[3] and the latest exponent of the art, the Rev. Eyre Hussey.[4]

The logical course seems to be first to describe the implements of the craft, and then endeavour to teach their use.

Bows are called "Self" if made of one piece of wood, and "Backed" if made of two or more strips of wood glued together. Self bows are generally made of yew or lance, though the term as applied to those made of the former wood is misleading, as they are almost invariably spliced at the handle. Self-yew is the dearest bow made, self-lance the cheapest. Backed bows are made of various combinations, yew-backed yew, which, as implied by the name, has both back and belly made of yew, being the best. In all other descriptions the back is made of hickory; yew, fustic, washaba, or lance supply the belly. In three-piece bows the back is generally hickory, the centre fustic, and the inside of the belly yew.

There is no question that the best bow is either a self-yew, or a yew-backed yew, there being little to choose between them; but both are expensive, require careful handling, and are easily damaged. Beginners are therefore advised to commence with a self-lance, taking to a three-piece yew, fustic, and hickory as their shooting advances, and a self or yew-backed yew, when their skill and knowledge warrant it. A self-lance does not last long, as it soon loses its "cast" or power, but the three-piece will last a long time. The more expensive bows are certainly the most pleasant to shoot with, but it must not be thought that good scores cannot be made with the cheaper backed ones, provided they are made the right shape; indeed many good shots use nothing else.

The shape of all bows should be much the same, namely, it should be quite straight, or slightly follow the string (Fig. 1). If the bow is at all reflexed, as it is called when the back bends forward, it is apt to jar on being loosed, the only exception being when a self-yew is made this shape in consequence of the natural growth of the wood.

The length of a lady's bow should be from 5 ft. 5 in. to 5 ft. 7 in., and of a man's from 5 ft. 11 in. to 6 ft. 1 in., the longer bow being the best. If longer arrows than the respective standard lengths of 25 and 28 inches are to be used, the bow should be longer, or the increased strain may break it. The weight marked on a bow is the number of pounds it will take to pull it—25 inches if a lady's, or 28 inches if a man's.

In choosing a bow care should be taken that the grain is close, even, straight, smooth, and free from knots or pins, especially on the centre of the belly, as the rounded part is called, and towards each end. This is particularly necessary with yew, as pins in this wood are liable to develop into "crysals"—as minute cracks, at first scarcely visible, but gradually increasing in size, are termed, which eventually cause the bow to break. The grain on the flatter side of the bow or back should be smooth and even from end to end, and in a self-yew the line between the white and darker parts of the wood should be well defined and even.

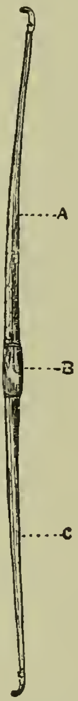


FIG. 1.—THE BOW.
A, Upper Limb.
B, Handle.
C, Lower limb.

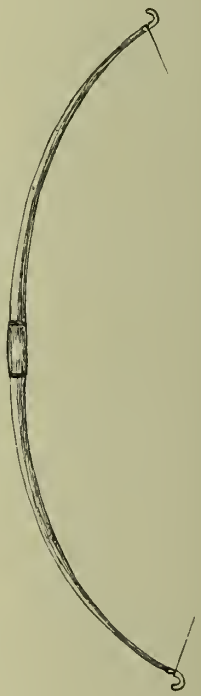


FIG. 2.—A GOOD SHAPE WHEN STRUNG.

The weight of the bow to be selected is an important point; it is a common thing to find archers "overbowed"—*i.e.* having a stronger bow than they can manage. The weight of bow that can be pulled is one thing, that which can be properly loosed is quite a different matter. It is a mistake to suppose that the stronger the bow the lower will be the trajectory; unless the bow is thoroughly under control, the reverse will be the case. Ladies are advised to begin with a bow of 24 or 25 lb. and men with 46 lb.

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[1] *The English Bowman.*
[2] *Archery, its Theory and Practice.*
[3] Butt's *Ford.*
[4] *Archery* (The Badminton Library).

The longest distance now shot is 100 yards; a properly loosed bow of 48 lb. will carry it well, and it is far better to be "under" than "over" bowed.

The weight being decided on, the back of the bow should be held upwards to see that it is straight, and that the two limbs are in the same plane. It should now be strung and the bend when drawn up carefully examined to see that the bow is rigid for about 20 inches in the centre, thence bending equally to each end (Fig. 2).

Arrows are made of deal, the best being "footed" with hard wood at the point or pile end, and these alone are to be recommended; for though good shooting can be done with a cheap bow, cheap arrows are in the long run the dearest, besides being unsatisfactory. Arrows are made of four different shapes: the "straight," which should be of the same size from end to end, but slightly reduced at the feathers; the "barrelled," which are largest in the centre, tapering both ways; the "bob-tailed," which are gradually reduced from the pile to the feathers, and the "chested," which is largest at about one-third of its length from the feather end, tapering thence towards both ends. This last arrow is only used for flight shooting, and it is the others which bespeak our attention. The straight arrow is the steadiest and stiffest, but it is not quite so fast as the barrelled, for which reason several good shots prefer the latter. The bob-tail is a weak, bad shape; it is not sufficiently strong to stand the blow it receives when leaving the bow, and consequently it "flirts" or flies off to the left. The straight arrow is the one recommended, but care must be taken that it really is straight, as many so-called straight arrows are bob-tailed.

The **feathers** are made of two patterns, the straight (Fig. 3) and the parabolic (Fig. 4). They should not be too large, and should be placed as far back as possible, the former shape being perhaps the better. The wing of the peacock supplies the stiffest and most durable feather, turkey's coming next, the "grey goose wing," that poets write about, having lost its charm to the fletcher.

The flight of an arrow, supposing it to be properly shot, is affected by its weight and balance. The weight, which is marked at the nock end of the arrow, represents its equivalent in new silver; thus an arrow marked 3.3 weighs 3s. 3d., 4.6 4s. 6d., and so on. The balancing point is that part of the arrow on which it will balance on the finger. It will generally be found that all the arrows in a dozen are not precisely alike in these particulars, a variation of 1d. or 2d. in weight not being unfrequent. The arrows should therefore be sorted into sets as nearly as possible alike in weight and balance, to be used at the same time. No doubt the difference in flight caused by the weight and balance not being exactly the same is not very great, but there is no reason for giving away anything.

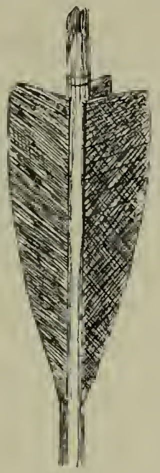


Fig. 3.
Straight Feathers.

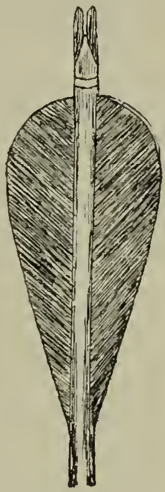


Fig. 4.
Parabolic Feathers.

The weight of the arrow should be adapted to that of the bow, for if the arrow is too light it will be liable to flirt. For ladies' bows up to 27 lb., 3.3 should be heavy enough, beyond that weight 3.6 is advisable. For a bow weighing from 45 to 48 lb. the arrow should not be lighter than 4.6, 4.9 being suitable for heavier bows. Arrows longer or shorter than the regular length should be heavier or lighter accordingly.

In order to ascertain if an arrow is straight, put the nails of the thumb and second finger of the left hand together, place the footing of the arrow upon them, and holding the nock of the arrow with the thumb and finger of the right hand twist the arrow so as to make it revolve. If it does so smoothly it is straight; if it is crooked it will jump.

Tips, as the leather protection for the fingers of the right hand are called, are made of two patterns, the knuckle (Fig. 5) and the screw (Fig. 6). There is not much to choose between them, but great care must be taken that they fit accurately, the top of each finger just showing through the top of the tip. The leather of each tip should be of the same substance, and not too thick. It will be found a good plan, in order to keep the tips supple, to rub vaseline into them, and before putting them on, the fingers should be moistened and rubbed on glue.

There are many other devices for protecting the fingers and obtaining a good loose; sewing pieces of leather on the fingers of an ordinary glove is a favourite device among ladies, and is not a bad one, provided the leather is not soft or spongy. The tab (Fig. 7) has many advocates, but it is not easy to use, and the beginner had best be satisfied with tips, or leather sewn on a glove. The tips, which are sold fastened together, to strap round the wrist, are to be avoided, as they never fit all three fingers.

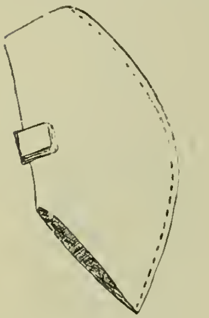


FIG. 5.—KNUCKLE TIP.

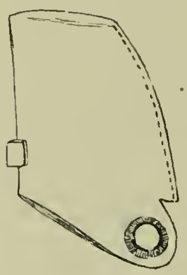


FIG. 6.—SCREW TIP.

The **bracer** or arm guard is strapped on the left arm to protect it, should the string strike it when the arrow is loosed. It is made of various patterns, the best being that in which the straps and bracer are cut out of one piece of horse butt, and graduated; this is called after its inventor the "Lewin" (Fig. 8). A less expensive shape, also made entirely in one piece, but of ordinary leather, will also be found satisfactory, but it does not fit so close to the arm.

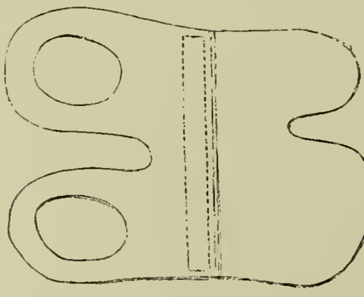


FIG. 7.—TAB.

The belt with quiver attached is necessary for ladies, but men generally now discard it, placing the arrows in a pocket of the shooting-coat. A tassel to wipe the arrows and a scoring-book complete the archer's personal equipment. The **targets** now used are four feet in diameter and made of straw, having a canvas face on which five concentric rings are painted—the centre gold, then red, blue, black, and white. The value of each ring is respectively 9, 7, 5, 3, and 1, and the arrow counts as if it were in the ring of the highest value which it touches. It is usual to have two targets pitched opposite each other at from two to five yards more than the distance to be shot, the centre of the target being four feet from the ground. Each archer stands at the proper distance in front of the target and shoots three arrows, which are called an end. After all have shot, another end is shot from the opposite target, and so on till the appointed number of arrows has been shot. The scoring-book is therefore divided into six spaces, the first four for the ends, and the last two for the total hits and score in the dozen. Supposing the first three arrows to have resulted in a blue, the next in a gold and red, the third in a black and white, and the last to have been missed, the dozen would be marked thus—

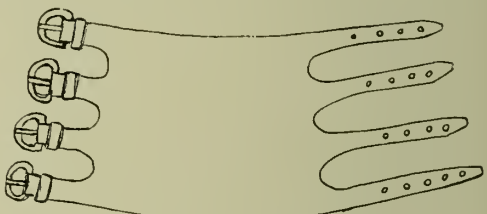


FIG. 8.—LEWIN BRACER.

5 - -, 97 -, 31 -, - - - 5 -25.

A few words are necessary before trying to instruct the beginner how to use his or her newly-acquired weapons. Archery in many respects resembles rifle-shooting, and, as in the latter, position and aiming-drill are highly useful, but of themselves will not make every one a first-class shot; so in archery, assistance can be given by useful hints, but practice alone will enable an archer to become a good shot.

First of all, it cannot be too strongly impressed on the mind of every beginner that deliberation and strict attention to every detail are absolutely necessary, and that undue haste is to be avoided. It is far better practice to shoot a few arrows carefully and well than a York Round against time. Losing one's temper, or giving up "because I can't shoot," is fatal. Few sports afford so many opportunities for losing one's temper as archery, and none exacts a greater penalty for its loss.

In archery, **position** is everything, and though everybody does not shoot in *precisely* the same attitude, still the difference among good shots will be slight. Some archers succeed in making, for a time, good scores in indifferent fashion, but sooner or later they come to dire grief. Many names could be given of promising beginners, who, having made good scores by bad methods, scorned advice, and after a year or two were reduced by their tricks to hopeless mediocrity or worse.

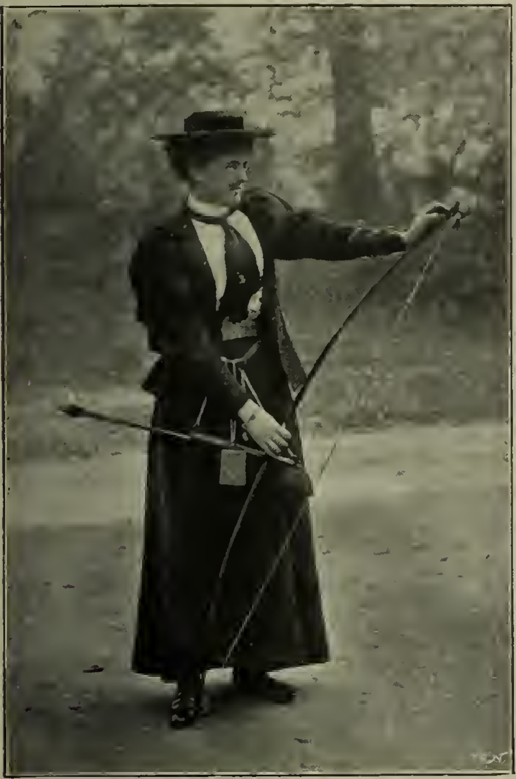


FIG. 9.—STRINGING.

Before attempting to shoot, the bracer should be carefully put on the left arm, the sleeve being drawn back so as to leave it on the inside smooth and free from wrinkles. The next thing is to "string" or "bend" the bow. Grasp the bow at the handle with the right hand, the back, or flat part, being towards the body, and place the bottom horn against the hollow of the right foot. Place the ball of the thumb of the left hand about five inches from the top of the bow, the fingers resting against the eye of the string. Draw the right hand towards the body, at the same time pressing down the left hand, and place the eye of the string in the nock of the upper horn with the fingers (Figs. 9 and 10). The method of unstringing is the same, except that the eye of the string is lifted out of the nock.

Now see that the string is straight by looking at the bow, string upwards, and also observe if the string at the handle is the proper distance from the bow (5½ inches for a lady's, and 6 for a man's). Next, see that the nocking-point is marked exactly opposite the top of the handle, so that the arrow, when "nocked" on the string and resting on the forefinger of the left hand, which should be even with the top of the handle, is at right angles to the string. This is important, as, should the nocking-point be too high or too low, the arrow will not fly properly.

Supposing a pair of targets to have been duly pitched opposite each other sixty-five yards apart, the archer should place himself on the mark five yards in front of one of them. He should stand sideways, the feet about eight inches apart, so that a line drawn through both heels should pass to the centre of each target. The body should be perfectly upright, the head erect, but turned to the left, the eyes fixed on the gold of the opposite target.

The handle of the bow should now be grasped, the upper part of the hand even with the top of the handle, the back of the bow parallel with the knuckles of the finger and thumb. Fig. 11 shows both sides of the hand. A line passing through the centre of the bow will, if the grasp be correct, fall just inside the knuckle of the thumb. The wrist must be quite straight; if it is bent back, the string will strike the bracer; if forward, power is lost. Now raise the left hand to the full extent of the arm, and, looking over the knuckle, see if the centre of the bow is on the gold. If it comes on it at once, the position will be correct; if it does not do so, raise the toes, turning on the heels slightly to the right or left till it does. If the hand cannot be

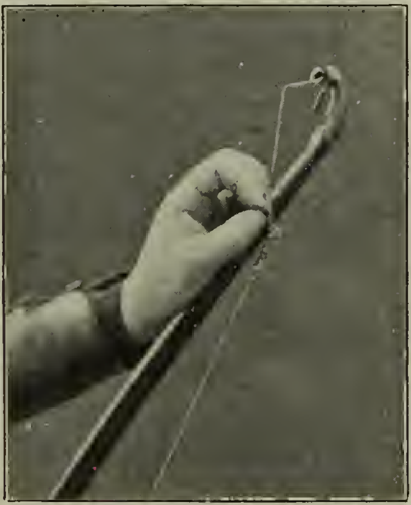


FIG. 10.—POSITION OF THE HAND IN STRINGING.

brought on the required spot without doing so, the right foot may be drawn back slightly. The position of the feet is all important, as it governs that of the shoulders, which should be at right angles to the target or point of aim. Should it be necessary, in consequence of wind, to aim to the right or left of the target, the feet should be moved accordingly; on no account should the required position be obtained by turning the body on the hips.

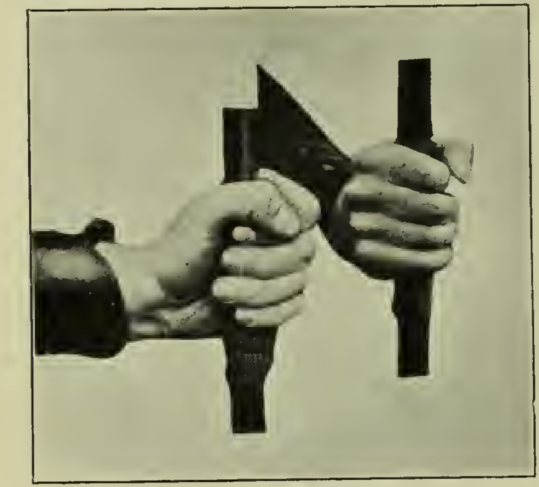


FIG. 11.—THE GRASP.

Having got the correct position, take an arrow with the right hand and place it on the knuckle of the left, placing the nock on the nocking-point, the cock feather (that which is at right angles to the nock) being farthest from the bow, and press the string home. Place the first finger on the string above the arrow, the second and third below it, holding the arrow without pressing it on the string. Hold the bow as nearly upright as possible, the left arm close to the side, the forearm bent level from the waist and pointing towards the target, and bring the right hand across the body as far as possible (Fig. 12).

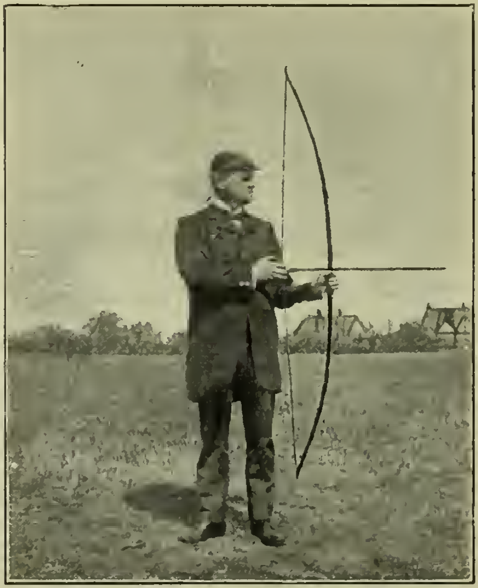


FIG. 12.—BEFORE THE DRAW.

Gradually extend the left arm, tightening the grasp on the handle, till the hand is on the point of aim, at the same time bringing the right hand just under the chin, the thumb touching it, the right elbow being slightly raised (Figs. 13, 14, and 15). It will be seen from Fig. 13 that the right elbow should not be raised above the line of the arm, till the arrow has been drawn about three-quarters of its length.

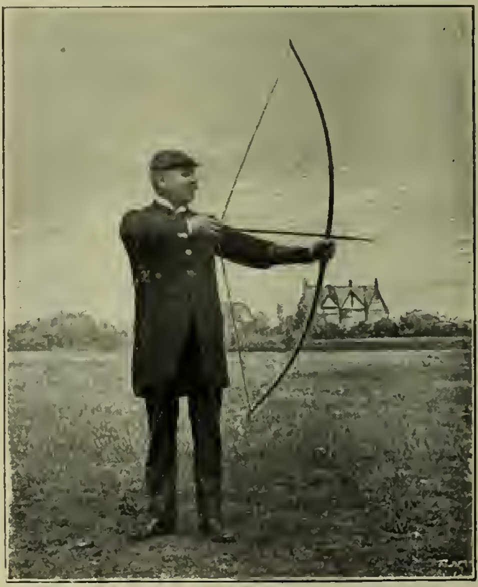


FIG. 13.—DRAWING.

During this motion, the body must be kept upright, resting firmly on the feet, the weight thrown slightly on the heels. The head must be erect, the face being turned towards the target. Both wrists should be quite straight, and not turned in or out. This movement should be repeated several times before trying to loose an arrow; indeed, it can be practised with advantage at home before a looking-glass, but it must never be attempted without an arrow in the bow, as the bow might be overdrawn, and broken.

Aim and **loose** now claim our attention. The point of aim will of course vary according to distance, and it is also affected by the strength of the bow, the wind, and above

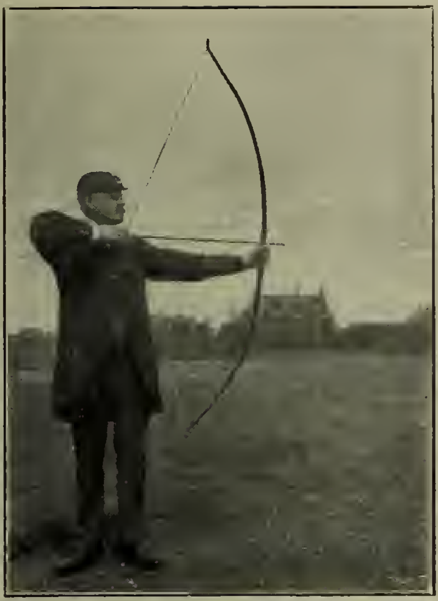
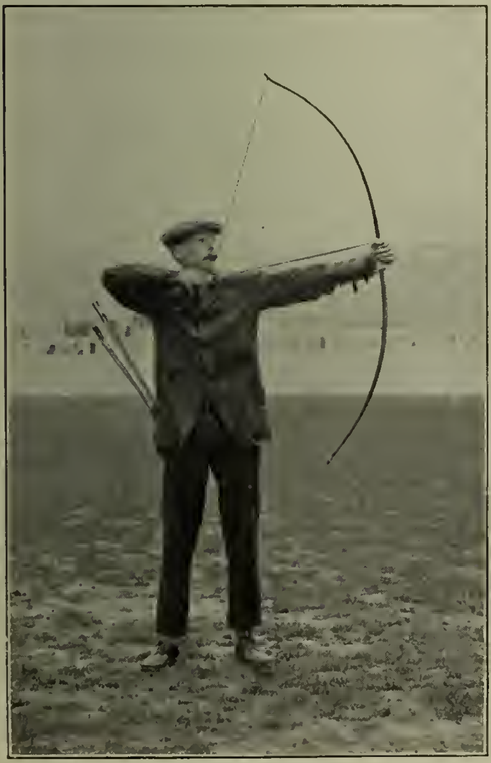


FIG. 14.—DRAWING



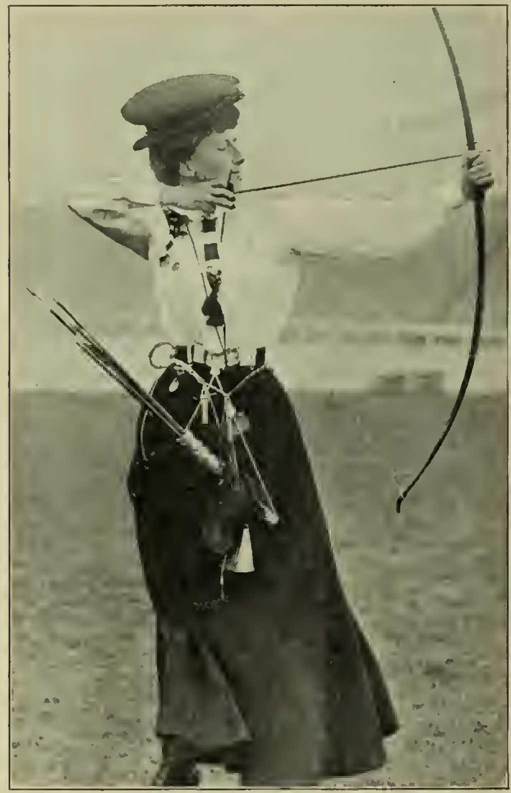
OLYMPIC GAMES, 1908. MR. W. DOD, WINNER.

all the loose. This is, however, merely a question of raising or lowering the left hand, as the right should always be in the same place, and practice alone will enable the archer to find the right spot. The bow being drawn as explained above, and still taking the gold as the point of aim, as soon as you are in position, see that the point of the arrow is pointing direct to the gold over the left hand.

Now comes the critical part of the shoot, the loose or release of the arrow from the bow, and truly a good loose is as valuable as it is difficult to attain. The best loose is obtained by drawing the right fore-arm slightly back, at the same time making a slight outward turn of the right wrist, the thumb remaining against the chin, the fingers remaining closed after the release, as they were before it (Fig. 16). Of course the whole operation takes far less time to perform than to describe, as the arrow should not be held longer than is absolutely necessary to get the aim, nor should it be loosed till the aim has been obtained. Care must be taken that neither the right hand nor elbow is allowed to drop, and that the former does not leave the chin. The left hand should also be kept up till the arrow has hit the target or the ground, as the archer will thus be enabled to ascertain if it has shifted during or after shooting.

OLYMPIC GAMES, 1908.—MR. H. B. RICHARDSON.

The importance of always drawing to the same spot cannot be too strongly insisted on, and this cannot be accomplished unless some part of the face is touched, the chin for choice. The right hand should never be brought behind the eyes, but should always be in front of them, or a correct aim cannot be obtained. The distance between the right hand and the eye acts as a back-sight does in a rifle, the point of the arrow corresponding to the fore-sight. For this reason, it is necessary that the head should be erect, and that the hand should be brought to the chin, *not the head brought down to meet the hand,* as if this is done the arrow must fly low to the left. It is also necessary that the right hand should not leave the face at the moment of loosing, as should it do so, the left hand will be pulled out of place. How important it is that the left hand should be kept steady will at once be understood, as should it be moved up or dropped the arrow will of course go high or low, and any lateral motion would equally prevent its going straight.



MISS Q. NEWALL, OLYMPIC GAMES, 1908. WINNER OF THE NATIONAL ROUND.

A common fault is to allow the right hand to move forward when the arrow is drawn up and while the aim is being taken. This is called "creeping," and must be guarded against, as it gives a forward loose which takes all the vitality out of the arrow's flight. Dropping the bow-hand and allowing the body to turn on the hips at the moment the arrow is loosed are also faults which must be avoided.

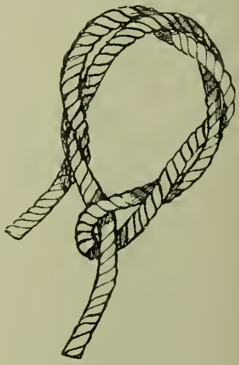


FIG. 17.—THE LOOP.

Attention must be paid to the string, and should any symptom of weakness be observed, a new one should at once be fitted, as the fracture of the string will often cause that of the bow; indeed, a careful archer should always have a spare string ready whipped. To put on a string, place the eye over the upper end of the bow, seeing that it is free from kinks, and push it down about six inches. To make the timber hitch with which it is fastened at the bottom, take a turn of the end round the string, and twist it three times round the loop (Fig. 17). The string requires (in order to assist the loose and to protect it should it strike the bracer, which it should never do) to be served or whipped with carpet thread for about two inches above the nocking point and five inches below it. To put this lapping on, string the bow, find the nocking point as before explained, and mark the string two inches above it. Wax the string well for seven inches below the mark, and place the bow, string upwards, on the knees. Lay half an inch of the thread along the string, and wrap the thread tightly round the end and string, till the waxed part is nearly lapped. Now take five or six turns of the thread round the string, in the reverse way, and bring the end of the thread to the lapped part, holding it with the thumb. Lap the reversed turns over the end of the thread and string till they are all undone,

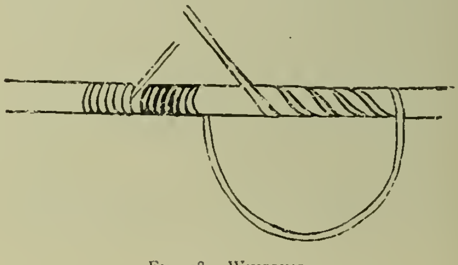


FIG. 18.—WHIPPING.

and then pull the end through, holding the lapping down with the finger and thumb to prevent its rising (Fig. 18). A nocking-point of silk half an inch long put on in the same way, makes the string ready for use. The nocking-point should fit sufficiently tight to bear the weight of the arrow.

All archery materials require careful looking after. The receptacle in which they are kept is termed an Ascham, and it should be so arranged that the bows do not rest on the ground, and that the arrows stand upright on their points, each arrow passing through two corresponding holes cut in two boards about fifteen inches apart. It is needless to say it should not be in a damp place, nor should it be close to the kitchen fire, an equal temperature being required. Should a favourite bow show symptoms of being "crysalled," it is as well to have it looked to at once, as a new belly can generally be put in. The strength of bows can be increased by shortening them, but this is not recommended unless the bow was originally extra long; to weaken bows is a simple matter for the bowyer.

For going to meetings a bow box, or waterproof canvas bag termed "a pole," should be procured, while the arrows can be conveniently carried in what is called the "Wiltshire" box, which has a compartment for tips, &c., and is made by Messrs. Aldred. Should the bows or arrows get wet they should be carefully dried, the string beeswaxed, and the feathers of the arrows shaken before a fire.

Roving, or shooting at unknown distances, is no longer practised, all shooting now taking place at known distances. The York Round, consisting of six dozen arrows at 100 yards, four dozen at 80, and two dozen at 60, is generally shot by men; the National Round of four dozen at 60 and two dozen at 50 is the recognised one for ladies. Longer distances, or "clout shooting," are only patronised by the Woodmen of Arden and Royal Company of Archers at Edinburgh.

Olympic Games, 1908. Ladies' Archery.

Shooting at a Popinjay, or painted wooden bird, was formerly a popular form of archery. In England it is extinct, but it survived at Kilwinning in Scotland till 1870, where it was called the "Papingo." The papingo was placed on the top of the

Abbey tower, and shot at from below, whoever brought it down receiving a "benn" or muffler. This style of shooting is almost the only form of archery still practised in France and Belgium, though the method of shooting is somewhat different from that of the Kilwinning Papingo. In France, outside certain towns, notably Calais and Boulogne, long poles may be seen with wires projecting at right angles, and graduated from the top. On the top of the pole and on the wires, when a meeting takes place, are placed imitation birds decked with ribbons, to each of which a specific value is attached, the highest being that of the top bird. Competitors stand sufficiently close to the pole to be able to rake the wires and top bird, using strong bows, and arrows having a broad flat horn head, receiving the equivalent value of any bird they may bring down. In Belgium somewhat similar competitions take place, a sort of penthouse round the pole regulating the distance the competitors stand from it.

It may be thought that the use of the bow in field sports is a thing of the past. Such, however, is not the case. Of its practical use in the chase and the delights which attend camping out with the bow for one's sole weapon, Mr. Maurice Thompson has much to say. The experiences of himself, his brother, and others in Florida, Georgia, Illinois, Indiana, &c., while sporting with the bow, are the subject of many pleasant pages in *Scribner's*, *Harper's*, the *Badminton*, and other magazines, and tell us of turkeys, herons, wood-ducks, thunder-pumpers, and other strange birds and beasts slain with the bow; bass or trout of four pounds weight also have fallen victims to it. The camp life seems to have closely approached the conditions existing before the introduction of firearms.

A member of the Royal Toxophilite Society, Mr. J. Straker, an enthusiastic archer, has for some years taken bows and arrows as part of his sporting-kit to India, and has met with some success in using them against birds. Of the advantage the bow has over the gun in not disturbing a tract of ground he speaks highly, but he has not, like Mr. Thompson, trusted wholly to the bow. Mr. H. Peard, M.B., has told us in the *Field* on sundry occasions of his sport in Argentina with a bow and arrows. Small partridges, tinamou ducks, spur-winged plover, nutrias, biscacho, and foxes, "horresco referens," are mentioned by him as falling victims to the "winged shaft." Even in England, rabbits are shot with the bow, so it will be seen that its practical use is not yet extinct. One thing stands prominently forward, that all who write on this particular branch of archery vie with each other in its praise.

H. WALROND.

GRAND NATIONAL ARCHERY SOCIETY.

SHOOTING REGULATIONS.

1. The Grand Annual Meeting will consist of three days' shooting: the first two for the principal prizes; the third for prizes subscribed for handicap sweepstakes based upon the shooting of the two previous days.

2. The Judges will be appointed by the Committee.

3. The Ladies will shoot each day the National Round, viz.: four dozen arrows at 60 yards; two dozen arrows at 50 yards. The Gentlemen, the National York Round, viz.: six dozen arrows at 100 yards; four dozen arrows at 80 yards; and two dozen arrows at 60 yards. Three arrows to be shot at each end.

4. The Targets will be placed farther apart than the specified distances, but at the proper distances marks will be fixed, from which alone the archers are to shoot.

5. The bugle will sound the assembly at 10.45 A.M., and will again sound for the commencement of the shooting at 100 yards at 11 *precisely*; after the 100 yards' shooting, time will be allowed for luncheon; at 2.15 P.M. the assembly will again be sounded, and at 2.30 *precisely* the bugle will sound for the Ladies to commence the shooting at 60 yards and the Gentlemen at 80 yards. The judges will appoint the time for the commencement of the shooting at 50 yards and 60 yards as they shall see fit. The bugle will sound accordingly. The judges shall also make what arrangements they shall see fit should anything occur to interfere with the shooting.

6. The Targets will measure four feet in diameter, and the centre of the gold shall be four feet from the ground.

7. The Captains will be placed—No. 3 at each Target, to take charge of the Targets and to score, assisted by No. 4.

8. Any Lady making three golds at one end shall be entitled to receive 1*s*. from every other Lady competitor, and any Gentleman making three golds at one end, 1*s*. from every other Gentleman competitor.

9. Any Archer having won one or more of the Grand National Medals, and, at subsequent meetings of the G.N.A.S., not wearing one (at least), shall pay a fine of 10*s*. each day that he appears without wearing and showing one such Medal, and the same with respect to the Brooches.

10. Every Archer's arrows must be clearly and distinctly marked with his or her name or initials, so that the owner may have no difficulty in claiming them or the Captain in distinguishing them. Archers must not draw their arrows from the target till the Captain has called on them to declare their hits, and has scored them. If an arrow be drawn by its owner before it is scored, it shall not be allowed to count or to be measured as a gold.

11. If from any cause an Archer is not prepared to shoot before all have shot, such Archer shall lose the benefit of that end.

12. Gentlemen will not be allowed to smoke at the Ladies' Targets, and it is particularly requested that no person will divert the attention of the Archers shooting by talking; and, while the Archers are in the act of shooting, no one (except the Archers) will be allowed to stand in

front of the *white line* behind the Targets. As soon as the Archers have all shot and advanced to the opposite Targets, all spectators must follow them and remain in front of the Targets to which they are going, until the arrows are picked up, when they must immediately take up their position again at the *white line* behind the Targets.

13. No persons, except competitors whilst shooting, will be allowed in front of the Targets.

14. The value of the rings on the Target shall be:—Gold, 9; red, 7; blue, 5; black, 3; white, 1. If an arrow touch two colours it shall be scored as in that of the higher value. Should any dispute arise as to whether an arrow touch the higher colour, the matter shall be decided by the Captain of the Target, subject to an appeal to the judge.

15. No Archer shall take more than one prize (the Challenge Prizes excepted). In the case of ties for any of the prizes, if two or more have an equal score, the prize for score shall be adjudged to the one who has the greatest number of hits. If two or more have an equal number of hits, the prize for hits shall be adjudged to the one who has the greatest score. In the event of the occurrence of ties which cannot be decided as above, the names of those interested shall be retained for further consideration. If any have an individual claim upon a subsequent prize, the name shall be struck out, the money pooled with that of the previous tie or ties, and divided amongst all those having an individual or collective claim to the prizes under consideration, a decoration being given to each person. The decoration for any individual prize shall be allotted to each person interested.

16. The Champion Prizes shall be awarded to the Archers gaining the greatest number of points, provided that those for gross hits or gross score be included; any points won by other Archers shall be re-distributed amongst those gaining the points for gross hits and gross scores.

The points are:—

Ladies.

Gross hits	2
Gross score	2
Hits at 60 yards	1
Score at 60 yards	1
Hits at 50 yards	1
Score at 50 yards	1
Total	8

Gentlemen.

Gross hits	2
Gross score	2
Hits at 100 yards	1
Score at 100 yards	1
Hits at 80 yards	1
Score at 80 yards	1
Hits at 60 yards	1
Score at 60 yards	1
Total	10

Should there be a tie between two or more Archers, the prize shall be awarded to the Archer having the greatest gross score.

17. If, owing to the state of the weather, the full number of arrows are not shot on the first two days, the deficient number shall, if possible, be shot on the third day. No prizes will be awarded unless one complete round is shot. And if the double round be incomplete, the Gross Score and Challenge Prizes shall be awarded on the one round only that has been completed.

18. No shooting will be allowed in the field during the three days, except when competing for the prizes.

19. It shall be the duty of the Committee to take cognisance of all matters whatsoever concerning the good order and fellowship of the Meeting, and also, if they think proper, to impose a fine of 2*s.* 6*d.* for any infringement of these rules, or for any offensive or improper conduct; and if the Committee shall be of opinion that the case is deserving of more serious notice, or if any fine imposed by them be not paid, the person so offending shall be disqualified from winning a prize, and from shooting again at the National Meetings.

20. Any Archer moving forward before all have shot their arrows, and the signal is given to advance, shall be liable to be fined 2*s.* 6*d.*

21. If any doubt or dispute shall arise on any point connected with the shooting, the matter shall be referred to the judges, whose decision shall be final.

Bibliography.—*The Art of Archery,* published from MS. of 15th Century, by H. Gallice, translated by H. Walrond (H. Cox), 1903; *The Theory and Practise of Archery,* Horace Ford, new edition by W. Butt (Longmans), 1887; *Archery,* Badminton Library, with bibliography (Longmans), 1894; *Archery for Beginners,* Colonel H. Walrond (H. Cox), 1904; *The Book of the Cross-Bow,* Sir Ralph Payne Gallwey (Longmans), 1907; *Bibliothèque du Sport, Le Tir à l'Arc,* Le Conte A. de Bertier (Hachette et Cie., Paris), 1900; *The Archer's Register,* Col. H. Walrond (Annual).

ATHLETICS, or ATHLETIC SPORTS—The wide term Athletics bears at the present day in the sportsman's vocabulary the special or restricted meaning of competition at running, jumping, and putting, or hurling, of weights, as practised on specially prepared tracks or grass fields in the open air. After being practised without much system for many hundreds of years in England for amusement, and for something like a century by paid or professional exponents, athletic sports have gradually, during the last thirty years, been developed upon systematic lines into an organised form of sport for amateurs. Every public school and most of the private schools of any size have an annual athletic meeting: each college at the universities has its meeting; there is at each university a meeting open to the whole university; and these are followed by the annual contest between Oxford and Cambridge in London, usually on the day preceding the Boat Race; the hospitals and military colleges follow the example of the universities; and hundreds of clubs throughout the kingdom hold meetings with competitions for their members and with "open" races—that is, open to every approved amateur. In each summer there is an Open Championship meeting held in rotation in London, the Midlands, and the North, under the management of the Amateur Athletic Association, which is the recognised governing body of athletic sports; and this never fails to attract entries from every part of the United Kingdom and occasionally from the United States and the Colonies. A similar system of athletic sports has taken firm root in the United States, where the sports are termed Games; and the system is already spreading in France and to some small extent in Germany. In 1895, there were a number of athletic events included in the so-called revival of the Olympic Games at Athens, several Americans, Englishmen, and Frenchmen being amongst the competitors, and the competitions held at London in 1908 during the Franco-British exhibition attracted a record number from all parts of the world.

The wide-spread popularity of athletics in this country fairly entitles them to be ranked among our national sports. The fine runner or jumper ranks in popular esteem with the fine cricketer, footballer, or oarsman. At the universities those who compete as "first strings"—*i.e.*, "first choices"—in each event at the Inter-University meeting are entitled, like the members of the Eight, the Cricket Eleven, or the Football teams, to wear the blue coat and cap which are reserved for those who represent one university against the other, and are known as "blues"; and in schools, colleges, and clubs, the best athletics are similarly held in high honour.

At the universities, the two winter terms are those devoted to athletics, the summer term being mainly devoted to cricket and boating; and the University athletic season concludes before Easter with the University and Inter-University sports. Most of the public schools follow the example of the universities in bringing off their athletic meeting before Easter. Throughout the rest of the country, however, the athletic season begins in May, and continues throughout the warm weather until the end of September, when the athletes betake themselves to paperchasing, football, or other winter sports. The Amateur Championship meeting is now always held on the first Saturday in July. As the Scottish and Irish Championships usually precede the English Championship meeting by a week or two, the athletes of the three kingdoms are best brought together at this date; but the fact of the meeting being held in the summer operates to the prejudice of the university athletes, as they find it difficult to get into condition at this time of year.

It is perhaps superfluous to say that excellence in athletics demands not only natural ability, but long and arduous training and preparation. Training, so far as diet and conditions of health are concerned, is treated of elsewhere [*see* TRAINING], and does not vary much in essentials from the training required for rowing or other hard bodily exercise. It is with the peculiar features of preparation and the requisites of success in the special events which are commonly included in the programme of an athletic meeting that the following articles will mainly deal. The programme selected for the earlier meetings of the two universities has done much to determine the line on which athletic competitions have developed. At the Inter-University meeting there are ten events—viz., 100 Yards, Quarter Mile, Half Mile, Mile, Three Miles (all flat races): 120 Yards Hurdle Race over ten flights of hurdles, each 3 feet 6 inches high, High Jump, Long Jump, Weight Putting (16 lb.), Hammer Throwing (16 lb.). The Amateur Championship meeting has the same ten events with the exception that the Three Miles is replaced by a Four Miles, and has in addition a Pole Jump, a Two Miles Steeplechase, and a Four Miles Walking Race. In addition there is a Ten Miles Championship Race, which is held in the spring at the conclusion of the paperchasing season.

A COUNTRY MEETING.

It is usual at an ordinary club meeting to make most of the races handicaps. By this means, large entries are secured, as the number of superlative athletes is small compared with the hundreds, or one may fairly say thousands, who, though of mediocre ability, are able to win prizes with a moderate handicap.

At the universities and at most of the big towns, athletic sports are held upon a regular running-ground which has a cinder track of a quarter or a third of a mile in circumference, with grass in the centre of the track, and specially prepared places for the Jumps, Weight Competitions, and Hurdle Races, the ground also including seating and standing room for spectators, and proper dressing accommodation for the competitors. In most country districts, the venue of the meeting is the local cricket ground.

Of late years, the popularity of athletic sports with spectators has rather tended to discourage the cultivation of Jumping and the Weight Competitions, and to increase the number of flat races. Jumping and Weight Competitions with many competitors take a great deal of time, and cannot so easily be witnessed and followed with interest as races round a track. At the present time Jumping and Weight Competitions are not practised in England nearly so much as in Ireland or Scotland.

The governing body of athletic sports is the Amateur Athletic Association, the practical work being done by three committees in the North, South, and Midlands respectively. To this body some 200 athletic clubs are affiliated, and about as many more, without being affiliated, hold meetings under "permits" from the governing body and under their rules and jurisdiction. To give some idea, by rough computation there are probably about 1,000 athletic meetings, great or small, held in the United Kingdom, and the number of persons competing throughout the country is certainly not less than twenty-five thousand.

MONTAGUE SHEARMAN.

CROSS-COUNTRY RUNNING.—Every year sees an increase in the numbers participating in so-called cross-country running, and clubs spring into existence in bewildering succession, some to flourish with the growth of years, but many either to become absorbed in larger organisations, or else to die a natural death. In spite of this, it is doubtful whether more than a small percentage of this number have any conception of the delights of real cross-country running, and it cannot be denied that the pastime has declined in popularity, and has lost caste amongst the educated classes. The reason, so far as London is concerned, is not difficult to understand. The rapid growth of the suburbs necessitates a longer train journey to reach the open country than formerly. Too many clubs are, through the exigencies of circumstances, compelled to have their headquarters in thickly populated districts; and the appearance of clusters of runners, all too airily clad, splashing through muddy thoroughfares, is not an inspiring spectacle, and undoubtedly tends to prejudice the minds of those who have had no opportunity of becoming acquainted with the sport at its best.

Infinitely the most enjoyable and invigorating branch of cross-country running is the old-fashioned paper chase, introduced about the year 1867. It is with sorrow that we have to record the fact that every year the paper chase finds a smaller place in the fixture-card of leading clubs, and that it is being displaced by the ever-increasing number of races with their attendant prizes, which involve traversing two or three set courses so often as to become quite monotonous.

If a paper chase is to be successful, the details cannot be too carefully arranged. Two hares are chosen, preferably of equal calibre, possessing a knowledge of the surrounding country. They should, before starting, have a general idea of the course they mean to steer. Each hare carries a long sausage-shaped bag supported from his shoulders, packed tight with printers' waste strips, which are recommended strongly in preference to squares of paper. It is essential to the success of the chase that a continuous trial shall be lightly laid; and the practice in vogue at our Universities of laying the scent in patches some distance apart is to be condemned. If these ordinary bags are tightly packed, the paper, with judicious laying, will easily last ten miles. A clever pair of hares will lay several false scents to check the too rapid progress of the hounds, and by taking advantage of cover and varying the nature of the country as much as possible the run is made more interesting. The grace allowed the hares is usually ten minutes, but it should not exceed fifteen minutes, and the hounds can be despatched in fast and slow packs if found desirable; to maintain interest the hounds should always have a fair chance of catching the hares. Upon the hounds receiving a check, say in the middle of a field, the pack should at once spread out in fan shape, and on the scent being regained the fact should be notified by bugle or call. The distance traversed will, of course, vary considerably, but it should not exceed ten miles, for there are few runners who can last a longer distance without undue exhaustion. Some runners maintain their stride throughout, and we have even known instances of men who have kept on their toes throughout a long journey, but the majority of runners are not strangers to a temporary feeling of fatigue during some part of the journey—it may be over plough or going up hill—but they are recommended to make the effort to maintain a jog trot rather than indulge in the luxury of a walk, because it is found that alternately walking and running materially increases the fatigue in the long run.

The dress suitable for cross-country running is a pair of twill knickerbockers cut fairly short, so as not to interfere with the action of the knee, a thin merino vest, and sweater if the weather be bad, and india-rubber or spiked shoes, the latter being preferable as giving a better grip on the ground.

Training for the cross-country championships has now been reduced to a science; and the gentleman amateur, though he may be a first-class cross-country performer, is no longer able to hold the position of a few years ago, unless he is prepared to devote the whole of his leisure time to training. The championships are now usually run round racecourses or enclosed spaces, instead of over genuine cross-country, and the question of gate plays an all-important part; this system is followed by betting with its attendant evils. If a competitor is training for a cross-country championship, say, ten miles, he is advised to take long road walks at a brisk pace, varied by occasional spins of two to four miles on the track or road, with a weekly run across country. Many runners fall into the fatal error of thinking the best form of training is to confine their work to cross-country, and to run from five to ten miles at repeated intervals. There could be no greater mistake, because they will quickly tend to become hopelessly slow, and moreover are likely to overtrain themselves and be quite unable to make the extra effort that is often called for at the crisis of the race.

The question of pace plays an important part in a cross-country race, and our experience is that scratch and back-mark men will find it advantageous to make the pace hot from the start, as, if fit, they are likely to maintain it fairly evenly throughout, whereas it is often difficult to increase the pace after a slow start, and as an illustration of this we may instance a cross-country championship, where it is generally recognised that the leading twenty at two miles will furnish the first fifteen at the finish.

No material alteration in the ordinary diet is recommended, the important point to bear in mind being that the training should be of such a character that the competitor turns up on the day of the race not only fit but anxious for his work.

We have dealt with the practical, rather than the historical, side of the question; firstly, because a record of performances is apt to become somewhat invidious, and, secondly, because there are not, and cannot be, any reliable cross-country records, owing to the marked differences in the nature of courses, and in their ever-varying condition.

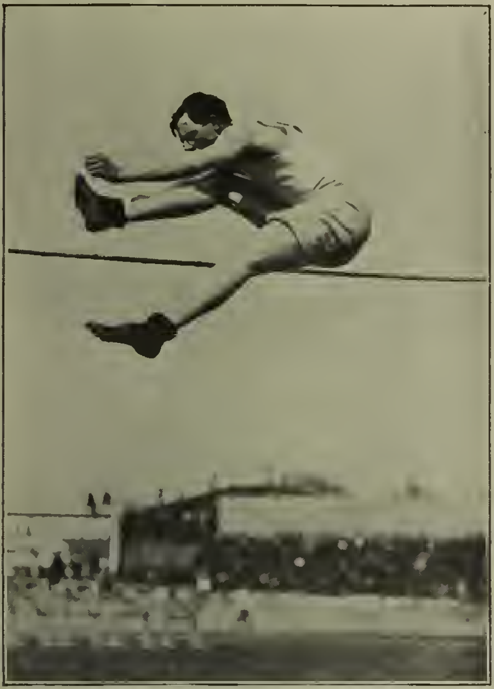
Over-anxious parents often place a veto upon cross-country running, but experience has amply proved that, given a sound constitution, the fear of over-strain is very small, and certainly no healthier or more invigorating recreation can be found.

Harold Wade.

HIGH JUMPING.—One of the prettiest sights of our athletic pastimes has of late years been much neglected by sports-promoters. Popular opinion has always held the view that the high jumper is a freak of nature possessed of wonderful "spring," the seat of which is usually supposed to be in the instep and toes. No view could be more erroneous. High jumping may be, in special cases, a gift, but is almost invariably the result of long and constant practice; nor is the jump accomplished by a spring from

High Jumping.

the toes. It is in reality done from the knees, off the flat of the foot and, in many cases, the heel. This latter is easily verified by examining the " take-off " on a soft day, when the heel-mark is always very prominent. The methods of jumping are various, but two main types predominate—viz., the straight jump, and the side-way or scissors jump. The pure straight jump —*i.e.*, lifting the knees directly up to the chin and so crossing the bar—is rare, and is more usually combined with the " shoot," or twist. The principle in all methods is the same. The first effort of the would-be aspirant to fame is to get his feet over the bar, and with this end in view, always to practise at a higher bar than he thinks he can clear.



High Jumping

Never allow him to raise the lath himself, as by so doing he is aware of the height he is essaying, and knows exactly when he has reached his usual limit. By employing an assistant to raise the lath, he is unaware as to the exact height and often clears more than he expects. Having learnt to raise his feet, he must now endeavour to raise his body in the air by a muscular contraction and also by using the limb, or limbs, which are over the bar as a lever: at the same time by means of a twist or shoot, and a sudden lifting of the arms over the head, he must so alter his position in the air that his feet, which have previously been as high as, and in many cases higher than, his head, now point directly downwards, and by this means he will lift his body and buttocks clear of the bar. It will thus be seen that, instead of a single spring, several separate actions constitute the true jump. In fact, his endeavour should be to climb over the cross-bar in sections, first the feet, then buttocks, and lastly the upper part of the body.

The Take-off.—It is essential to find a level spot from which to take off at a given distance from the bar. Practice alone will determine the correct spot for each individual performer. This spot should be fixed, and always adhered to. A simple method in practice is to stick a hair-pin through a piece of paper, which thus catches the eye.

The Run-down.—The length of the run varies with each individual, but should be short for the low jumps, and gradually lengthened for greater heights, and should be as long as it can be made without tiring the muscles, as the momentum hereby gained allows more time for executing alterations in position while in the air. The last three steps should be somewhat longer than the others, and of the nature of slight jumps, and should, like the take-off, be fixed.

A. C. B. Bellerby Jumping.

Training.—As to training for jumping, all the muscles of the body must be in good condition. Sprinting is excellent: gymnasium work is also good. All toe-exercises are useful, especially skipping; in short all exercises tending to strengthen the muscles round the knee-joint. One should never jump more than three days a week, and never within four days of a competition, as the muscles are apt to lose elasticity. Stiffness must be vigorously guarded against. High kicking is very useful during the off-season.

High Jumping.

The shoes should be light, strong, and tight-fitting, and should in addition to the ordinary toe-spikes, contain three heel-spikes arranged in triangular form, with the apex of the triangle posteriorly. If possible, a pit should always be used to jump into, as by this means the jar which always follows on landing is greatly diminished.

But infinitely more important than all of these are the qualities of self-confidence and pluck, without which no one need hope to become a successful exponent of jumping.

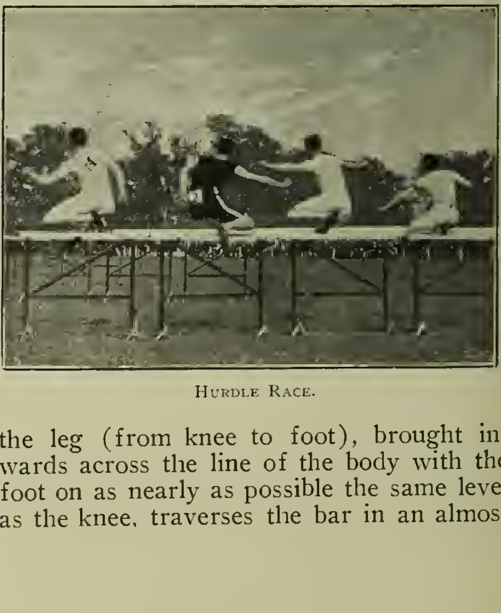
Reginald Williams.

HURDLE RACING has been in vogue since the early days of amateur athletics, and perhaps in no branch of athletic sports is proficiency more difficult to attain.

Hurdle races at various distances, such as 300 yards and 440 yards, are at times included in the competitions at athletic meetings; but from the first, the favourite distance has been 120 yards, with ten flights of hurdles, 3ft. 6in. high, placed ten yards apart, thus leaving fifteen yards from the starting-line to the first hurdle, and the same distance between the tenth and the winning-post. Sprint hurdle races must always be run on a straight course. In this country they are almost invariably run on grass, which must be perfectly level; but in America it is customary to use the cinder track, which is undoubtedly faster. Hence the American records are slightly better than our own.

The Hurdle.—The modern hurdle consists of an obstacle specially made with perfectly level top bars; the result is that flights of uniform regulation height are secured, and no competitor is benefited or impeded by any irregularities in the top bar, as was so often the case in the old style of hurdle. They are fixed on short pedestals of about a foot in length, and are much superior to the old hurdles in that they can be easily moved and the necessity of driving into the ground is obviated.

It was early discovered that in the race of 120 yards with ten flights, each 10 yards apart, three was the requisite number of strides on the flat between the hurdles; and no one can hope to attain even mediocrity as a hurdle racer unless he can accomplish what is generally known as the "three stride" method. This consists in taking three complete strides on the flat, the fourth stride carrying the runner over the hurdle. To accomplish this the runner must be careful to approach the first hurdle at the highest speed attainable, and in rising from the left foot (jumpers usually preferring to spring from the left) the right knee is raised upward and forward above the hurdle, and the leg (from knee to foot), brought inwards across the line of the body with the foot on as nearly as possible the same level as the knee, traverses the bar in an almost



Hurdle Race.

horizontal position, and is then brought to the ground as rapidly as possible. In the meanwhile, the left leg, with the knee pointing outward, is brought up rapidly as the body passes over the bar and is carried forward to the ground, thus constituting the first of the three strides.

The practised hurdler manages to gather up his legs in clearing the hurdle in such a way that only an inch or two intervenes between his body and the top bar.

Hints to Beginners.—A beginner must remember that the hurdle must be cleared in a stride (*i.e.*, he must rise from one foot and alight on the other), and that he must in no case jump it; he will soon discover that jumping the hurdle will necessitate his taking five strides instead of three. Godfrey Shaw, of the London Athletic Club, probably the finest hurdler this country has produced, clears as much as fifteen feet in his stride over the hurdle, thus leaving the same distance to be accounted for in the three strides before rising at the next, and goes over the ten hurdles without so much as touching one. It will be seen, therefore, that the three strides, which appear almost insuperable to the novice, average only five feet each, or much less than he would be taking if running 100 yards on the flat.

Should the beginner find (as he no doubt will) that the regulation hurdles are too high, he should commence by practising over three or four obstacles of about 2ft. 6in. in height, but always ten yards apart.

When he can accomplish the three strides over these, he should gradually increase the height and number of the obstacles.

There are several qualities necessary for the making of a crack hurdler. He must have speed and jumping power (hence it is that good hurdlers are frequently good long jumpers); he must have, too, dash and determination, and not be afraid of falling or barking his shins. That there are comparatively few hurdlers may be attributed to various causes. Among other reasons, this branch of sport is not supported or encouraged by athletic clubs as it should be, by facilities being given for proper practice, or by including hurdle competitions in the programmes. Again, few good sprinters will take to hurdling, as there is little doubt that the mechanical and artificial action necessary in hurdling interferes with speed on the flat.

With regard to training for hurdle races, constant practice is the thing most needed; rigid dieting is comparatively unimportant.

In hurdle handicaps, where men have

HURDLE RACE.

been known to give as much start as twenty-five yards, the runner most heavily weighted starts so many yards behind the scratch, and is usually described as "owing so much." Thus the limit, or longest start competitor, is usually placed on the scratch; though it sometimes happens that, on account of the length of the course being limited, the longest start man is placed as much as five yards in front of scratch, and has then only ten yards to run before reaching the first hurdle.

A. H. Healey, Winner A.A.A Sports, 1909.

Finally, the beginner must remember that in hurdle racing constant practice will probably effect greater improvement than in any other branch of athletic sports. Frequently men who as novices are very slow, and who have the greatest difficulty in mastering the three strides, develop eventually into first rate hurdle racers.

C. L. Lockton.

LONG JUMP.—Long jumping ability is made up of two elements, **pace** and **spring**. Pace in the run-up supplies the impetus; spring enables the jumper to lift himself into the air so that this impetus has time to act before the law of gravitation takes effect, and also adds a certain amount of forward motion itself. A man who can jump well but is a slow runner can achieve a certain degree of success in the long jump by virtue of his spring alone; similarly a fast runner without much jumping power can cover a certain distance if he learns to rise a little at the end of his run. The best kind of long jumper is the man who is both a fast runner and a capable high jumper.

Thus it is clear that in training for the long jump, besides practising the long jump itself, a man must cultivate his sprinting and high jumping powers to their highest pitch. Practice at the long jump will enable him to combine the two skilfully.

Before beginning such definite training, it is necessary first to get into general condition by playing cricket, football, or any other game that gives good exercise; or to go through a course of grinding walks. Then should follow a week or fortnight of easy exercise on the cinder-track, consisting chiefly of sprinting and a little high jumping. This preliminary training will have got the muscles used in the long jump into working order, and actual practice may then begin. An experienced performer will not require more than a month's further practice to produce his best effort, though some men prefer to take much longer. Both in preliminary and in actual training for this event, it is absolutely essential not to do too much work a day. Two or three days a week may be given to serious long jumping, prefaced by about three high jumps and two or three short sprints. The other days should be devoted to serious high jumping and determined sprinting, A novice who has to learn the way to long jump must give himself six or eight weeks in order to obtain sufficient practice without overworking himself. Hurdling is an excellent subsidiary exercise for a long jumper, and it is a good thing to run over the entire length of flights or to take three or four flights four or five times. Hurdling and long jumping ability often go together, and if a man wishes to train simultaneously for both events he must give himself long enough to practise both adequately without having to do too much work a day.

The long jumper's sprinting practice should be very much the same as that of a pure sprinter. He should confine himself chiefly to short bursts of forty yards, with an occasional run through the hundred yards, varied by a stride over three hundred or a lap well on his toes.

In his high jumping practice he may follow the methods of the professed high jumper, supplemented with occasional "high-long" jumps—*i.e.* over a lath fixed at from four feet six inches to five feet and taken at the end of a fast run of about twenty yards.

With regard to actual practice at the long jump, he must aim at three things—to learn to take-off with the ball of his foot on the taking-off board; to do that when going at full speed; and to jump as high as possible into the air.

There are two reasons for taking-off on the board: first, that if the jumper takes-off behind it he is not credited with the full distance he has covered, all jumps being measured from the edge of the board nearest the pit to the hindmost heel-mark; secondly, because the board is firmer and more springy than the cindertrack. When a jumper takes-off six inches behind the mark, he loses a foot, if not more. This accuracy in taking-off is partly mechanical and a matter of practice, partly a matter of eye. When a man is fit and in good jumping fettle, his eye, brain, and foot work so well together that he takes-off exactly where he intends. At the same time, it is fatal to look at the taking-off mark while running-up. His eyes ought to be fixed eagerly on a spot where he hopes to land—*i.e.* somewhat *beyond* his usual jumping distance. It is most helpful to have a piece of paper put in the centre of the pit about a foot further than he has ever jumped. It not only takes his eyes off the board, but draws him out. In order to gain mechanical accuracy, a mark should be made on the cinder-track. Behind this the jumper should start and, after a few yards' run, plant his toe on it, continue at full speed up to the board, and then jump determinedly. In nine cases out of ten he will have taken-off behind the board, as can be seen by examining the track. Before starting for the next jump, the mark should be moved forward as many inches or feet as he took-off behind the board.

Long Jump.

It is a great mistake to shorten or lengthen the stride in running up. It not only makes it impossible to acquire and practise mechanical accuracy in taking-off, but lessens considerably the impetus which is the *raison d'être* of the run-up. The length of the run-up should be between forty-five and fifty-five yards. Practice will soon discover the suitable length. A man's run-up to a long jump should be the facsimile of the first part of a hundred yards as run by him. The whole run should be a winding-up for the jump.

Olympic Games, 1908. F. C. Jones, Winner of Running Broad Jump.

The reason for jumping high has been mentioned. The difference between a first-class and a moderate performer in this respect is most marked. It is possible to jump too high, just as a cricket ball may be thrown too high for length; but at the end of a run-up at full speed it is practically impossible. As a working rule, it is safe to advise a long jumper to jump as high as he can—*i.e.* much higher than he feels inclined.

The best kind of shoes for long jumping are ordinary hurdling shoes with one or two spikes in the heel. It is useful to have a pair for practising with thickened heels, as the heel is planted with great violence on the ground in taking-off. *Bruised-heel* is a common complaint with long jumpers. Care should be taken that the pit is well dug up and softened before jumping, and that no rake, spade, or other edged tool is left near the pit, in case of a sprawl or fall out of the pit after landing. It is a good thing, especially in cold weather, to rub the legs and back well before starting work. A gentle sprint and two or three small high jumps as preliminaries should always be taken in order to get the muscles into working order and prevent them from being strained or torn by the sudden concentrated effort implied in a long jump.

C. B. FRY.

POLE JUMPING.—Owing to a few unfortunate accidents, usually resulting from lack of care in the selection of a suitable pole, this, one of the oldest of our English sports, has practically dropped out of the list of events of most sports-holding clubs. This is deeply to be regretted, as in addition to being a most popular item with spectators, it is in itself a splendid exercise demanding much all-round ability.

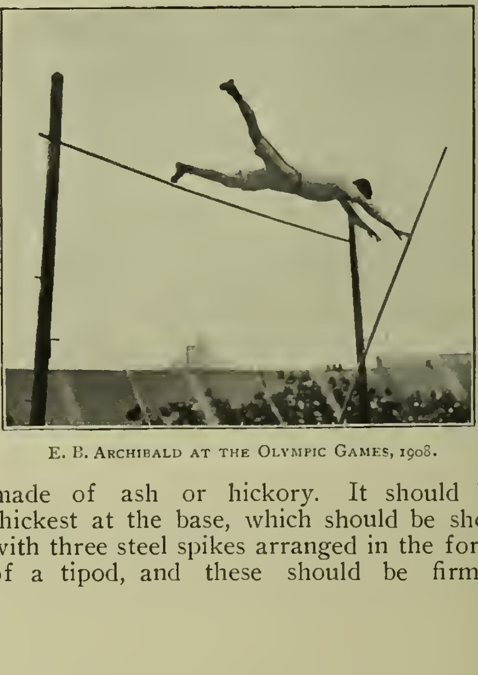
POLE JUMPING.

Broad Jumping with a pole was for many years a necessity, and subsequently a sport, in the Fen districts of Lincolnshire and Cambridgeshire, and from this doubtless the pole-jumping of the present day had its origin. It seems strange that broad jumping with a pole should never have found its way into our athletic programmes; but as sports-promoters are ever on the look-out for attractive novelties, it is possible that it may yet be seen. Though originating in the Fens, pole-jumping is now almost entirely confined to the Furness district of Lancashire, and is especially associated with the town of Ulverston, from the immediate neighbourhood of which most of our recent champions have sprung. Here it still retains its hold on the people, and may it long do so! He who would attain excellence in this branch of sport must be at once a jumper and a gymnast and must have no lack of pluck, for strains and bruises are of common occurrence.

There are two distinct types of pole-jumping, the old and by far the more graceful type, and the new, or what may be called the *gymnastic*, type. The **old type** of jumper, now rapidly becoming extinct, grasped the pole firmly in the lower hand slightly below or on a level with the jump he was about to attempt, took a longish run, and having planted the pole firmly in the ground about one foot in advance of a horizontal line drawn between the bases of the two uprights, sprang into the air, throwing his feet as high as possible and then with a twist raised his body clear of the lath, being careful at the same time to loosen his grip and throw back the pole before the lath became displaced.

In contradistinction to this, the **new type** of jumper, running slowly to the take-off, springs into the air, and the moment his pole assumes the perpendicular, climbs rapidly hand over hand up it, and with a quick lift raises his legs and body clear of the bar. This method, though demanding great ability, is, we think, more in the nature of a gymnastic display and should, we venture to suggest, be confined to such competitions. Though recognised as legitimate pole-jumping by the English Amateur Athletic Association, it has never been recognised or allowed by the A.A.A. of America.

To turn now to practical details. The first thing to do is to procure a good, strong, flexible pole as light as is consistent with safety, not less than eleven feet in height, made of ash or hickory. It should be thickest at the base, which should be shod with three steel spikes arranged in the form of a tipod, and these should be firmly



E. B. ARCHIBALD AT THE OLYMPIC GAMES, 1908.

secured by a metal ring. This gives a firmer grip than one spike. The pole should gradually taper from below upwards. The uprights should be square.

Take-off.—The take-off should be selected with great care, and a pit of large dimensions provided on the landing side, which should be filled in with sawdust and earth. By these means many a jar and accident will be avoided. High jumping must be assiduously practised and also gymnastic exercises of all kinds, rope- and pole-climbing being essential.

Pole Jumping.

Reginald Williams.

RUNNING.—Before the days of organised athletics, runners were heard of who had the reputation of being able to beat their opponents at any distance. In the present days of highly specialised effort, a runner who essays all distances is likely to prove the master of none. One never hears to-day of a sprinter who can perform well at long distances, or of a long-distance runner who is anywhere near the front rank of sprinters; and the few all-round athletes who appeared in the early days of the athletic movement would, if they had been competing to-day, have been compelled to devote themselves to one particular class of distance if they desired to acquire championship honours. Nowadays, a runner is either a sprinter—that is, accustomed to run from 100 yards up to 300 yards at full speed—in which case the limit of his special abilities will probably be a quarter of a mile at the outside—or he may run the middle distances—that is, from a quarter to a half-mile; or he may be a long-distance runner, with distances from a mile upwards. Men cannot, of course, be measured by exact standards, and he who can run a mile well and he who can run a quarter may often meet together on even terms at a half; but for purposes of rough classification, to divide runners into the three classes of sprinters, middle-distance men, and long-distance men, is to draw the dividing lines as closely as nature will allow them to be drawn.

Sprinting is the name given to the running of short distances at "full burst." Sprinting is perhaps more popular, both with spectators and athletes, than any other class of race, and a sprint handicap at 120 or 150 yards is likely to produce the largest entry of all at a sports meeting. But although the number of mediocre sprinters is large, the number of really fine sprinters is very small, and it is seldom that a man reaches his best form until after two or three seasons of steady practice.

Success in sprinting comes more from the rapid repetition of the stride by bringing up the legs quickly than from artificial attempt to lengthen the stride. The more the runner practises "bursts" of speed the more he will find his stride is naturally lengthening by his striding from the hips and not from the knees. The natural sprinter is nearly always a man of big thighs and strong back, and the capacity for attaining to really first-class form consists in being able to "put one's back into it," and to keep up a prolonged and vehement burst at high pressure throughout the whole distance one has to go. A great practical exponent of sprinting once expressed an opinion that to win a sprint one should "run like a madman." There is some truth in this: the sprinter has to learn to keep up an abnormal burst of speed or he will be left behind.

To come to practical directions, the sprinter must continually practise short bursts of speed; he must stride well from the hips so as to lose not an inch of his stride; should run as straight as an arrow goes from the bow; and should be careful not to throw his shoulders too far back, as this tends to shorten the stride: the rest must be left to natural capacity and to assiduous practice.

It is of immense importance to a sprinter to start quickly. Until about seven years ago the received method of starting was for the runner to stand on his toes with the right foot seven or eight inches behind the left foot so that it could be brought up quickly for the first stride, the body being kept square to the starting-line. Of late years most sprinters have taken to starting with both hands resting lightly on the starting-line. When the pistol is fired, the runner gathers himself up and darts forward, at the same time rising to the perpendicular. There can be no doubt that the new style is efficacious, as it is now almost universally adopted. It has undoubtedly rendered the starting of sprint races much easier and fairer, for while the runner has his hands on the ground he cannot "break away" from the mark, and if a runner "breaks away," he is, under the A.A.A. rules, put back a yard.

Frequent practising at starts and bursts and an occasional run over the full distance he is training for, should be the regular work of the sprinter; above all, he should never run alone, but have some one to sprint with him. When a man sprints alone, he often gets slow and sluggish without noticing it.

FINISH OF A SPRINT.

A sprinter must do his best, by one form of exercise or another, to get hard and muscular without getting stiff; for stiffness is fatal to speed. It is undoubtedly a good thing to be well rubbed over the back and legs after each day's practice. On the day of his race, the sprinter should always take a short "burst" on his way down to the starting-post to warm the muscles.

Sprinting requires at least as many weeks' practice as any other form of running; a month, at shortest, is necessary to acquire one's best form.

Middle Distances.—*The Quarter Mile.*—A great many sprinters, after a little experience and with careful training, develop into fine quarter-milers. In fact, when a man is running four hundred and forty yards in less than 50 seconds, as many amateur runners have done and can do, he must obviously go at full speed nearly every yard of the distance. But there are many runners who are but indifferent sprinters and yet can do marvellous performances at a Quarter. The two best quarter-milers of a few years ago, E. C. Bredin, of the London Athletic Club, and W. Fitzherbert, of the Cambridge U.A.C., were each of them good enough on their day to beat 49 seconds for a Quarter Mile, and yet as sprinters they were barely in the second rank. The same remark applied to L. E. Myers, the American, and H. C. L. Tindall, of Cambridge, the two best amateur quarter-milers of their day. From this it appears that it is fairer to describe a Quarter Mile as one of the middle distances, for all the men I have mentioned could run equally well at Six Hundred Yards and at Half a Mile. Still, the fact remains that in the Quarter Mile races two runners of an entirely different class often meet; the sprinter, who is strong enough to struggle home over a Quarter, and the middle-distance man, who is running his own distance.

The training for the distance should be entirely different for the two classes of men. The sprinter must be careful not to overdo himself and thus get jaded and slow, but he should frequently run spurts of three hundred yards, or thereabouts, to get used to prolonged effort, and must be very careful in his diet so as to preserve every ounce of his staying power. The regular middle-distance man must train differently: he is usually a lighter man than the sprinter, and he can stand more hard work, but when once he has got moderately fit, what he requires most is speed, and he must assiduously practise sprinting and starting to improve his speed.

Again, when it comes to running the race, the sprinter must use different tactics from the middle-distance runner. He must use his pace when he has got it—that is, at the beginning of the race—for after he has covered the third of the distance he will find that his power of "making a burst" is all but gone; the middle-distance man, who can rely on being able to finish out and to keep his stride to the end, wants a pacemaker, some one who will put him out in the early stages of the race. Let us illustrate these abstract principles by an example. Some of the great struggles of late years at a Quarter Mile were those between Jordan, of Oxford, and Fitzherbert, of Cambridge: their races are and ever will be memorable historic contests. The Oxonian was a fine natural sprinter; the Cambridge man had only learnt to run short distances fast by assiduous practice: he was not a natural sprinter. The tactics for Jordan were to try to get away from his opponent early in the race; if he did not, his slower opponent could outstride him and cut him down at the finish, as he did in 1895 and 1896. In 1894 and 1897 Fitzherbert let Jordan get well away from him, and was never able to get up to his shoulder. Many are the races, too, which Bredin threw away or jeopardised by starting like a snail, although he could finish like a lion.

The sprinter, then, who wishes to include the Quarter Mile in his repertory must recollect that, although he has to get hard and strong, it is upon his speed that he must rely; and at all hazards he must retain his dash. He can lay the foundation of his staying powers by walking, which hardens the legs and back, or even by rowing, or by lawn-tennis or any hard exercise; but when he begins to train for his races, he must be careful not to get slow and stiff by pounding round the path at longer distances. The middle-distance man can train for his Quarter as he trains for the Six Hundred Yards or the Half Mile, of which we shall now proceed to speak.

START FOR THE QUARTER MILE.

Six Hundred Yards.—This is a very popular distance which is often run. The pure sprinter cannot last the distance, and the middle-distance men have it to themselves, but it is an interesting race, because a Half Mile race attracts many who are really long-distance runners with staying power and no speed except that which comes from a long natural stride; but a Six Hundred Yards race is necessarily confined to middle-distance men alone. To run fast at Six Hundred Yards, the half-miler has to be careful to push himself along either by a pace-maker or by learning by means of a watch-holder how fast he is going the first half of his distance.

The *Half Mile Race* produces perhaps the most interesting of all athletic contests. It lasts but two minutes, or thereabouts, and therefore cannot grow tedious, and it presents scope for staying power, judgment, and spurting. While many long-distance runners can do fine performances at half a mile, they are bound to be outpaced by the really fine middle-distance runner. There are plenty of instances of men who, though good at a Quarter, have not sufficient speed to hold the sprinters, and good at a Mile, yet are unable to keep amongst the first flight of milers, and yet at half a mile are magnificent runners. It is fortunate, therefore, that a Half Mile now figures in the Oxford and Cambridge programme, as the middle-distance runner used to have little scope for his abilities at the Universities. There was of course a natural reluctance to interfere with the programme and with the chance it gives to strength, as distinct from speed, in the Weight-Putting, and Hammer-Throwing events, and it was at one time thought necessary to have an uneven number of events.

However, to return to the half-milers. The middle-distance men are bound to have a good deal of staying power, and should not be afraid to take a good deal of work. In practising, they must learn to run to a watch—that is, to keep going all through the race by learning to run the first quarter fast. If a man wants to run a Half Mile under two minutes, he should do his first quarter in 58 seconds, and nothing can teach him to know that he is keeping up his pace better than the "running to a watch" held by his trainer. He should frequently run Quarter Miles and Six Hundred Yards in practice, and occasionally the full distance, starting to do his distances slowly when he begins his training, and gradually quickening up as he is approaching fitness and his best form. Nor must he forget to practise bursts of speed, as every runner is the better by improving his pace and by learning to make a sprint, but the main thing a half-miler has to achieve is to go strong and brisk in the early stages of the race. Many half-milers are inclined to be sluggish in the first stage, and for such the best tactics in a race are to start a runner who will "make the pace" for them. The pace-maker can run his first quarter in fixed time, and he will thereby draw out the half-miler, who will hang not far behind him, until he takes up the running after the half distance. The American, Kilpatrick, who held the amateur world's record for Half a Mile, was rarely known to do a fast time without a pace-maker to draw him out.

The pace-maker in such contests should have orders to run the first quarter in about a second faster than the "crack" requires to do the same distance, and this is pretty sure to produce the desired effect.

One Thousand Yards and *Three Quarters of a Mile* are distances occasionally run. Experience has shown that the former is particularly a middle-distance event. Most half-milers can cover the additional 120 yards if called upon. A race at Three Quarters is usually chosen because it makes rather an open thing when a good miler and a good half-miler are matched at a distance which is half way between the two. At this distance the chances are all in favour of the miler, for three-quarters of a mile is a distance generally beyond the powers of the middle-distance runner.

Long Distances.—All distances from a Mile up to Four Miles are common at meetings at the present day, nor is a Five Miles Race by any means a rarity, and, since paperchasing became popular, a Ten Miles Flat Race has formed part of the championship programme. It is hardly possible to separate long-distance runners into classes, and the only general remark that can be made as to the classification of long-distance men is that the lighter their weight the more likely are they to be able to spin over the long distance. The rules for getting fit for long distances are fairly simple; the runner must get down his weight, and do a lot of work. We do not of course mean to say that cases of men overworking themselves and getting stale are not common enough, but the long-distance runners succeed by their endurance and staying power, and are able to stand a lot of work, and every pound of superfluous flesh will tell in a long race.

It is by no means uncommon for a runner to hold the championship at One, Four, and Ten Miles in the same year, which should prove the point we contend for, that all long-distance men belong to one class. To win the championships at One and Four Miles in the same year the runner has to do both races in the same afternoon. The Ten Miles championship is run in the spring at the conclusion of the paperchasing season, at which time all the long-distance men are likely to be as fit and hard as only paper-chasing can make them.

For a man to work up to his best form in long-distance races he must run to a watch in the way we have mentioned before. His trainer (or he himself after a season or two, for every man should soon learn to gauge his own strength and health), can judge on each particular day whether he should do a little more or a little less work, for this depends on the state of a man's health. It is a fatal mistake to attempt to get fit by doing too much work in a limited number of days. A slow and steady increase of work, which means doing the distance selected at a gradually increased pace, is the safest plan for success.

A FOUR MILE RACE. 1ST LAP.

The runner who confines himself to the Mile race only must possess some considerable speed. The first quarter in a Mile championship is often covered in a minute or thereabouts. In 1885, when the amateur record was made by F. E. Bacon, the first quarter was covered in 58 seconds, and the half mile in 2 minutes 5 seconds. As the distances get longer, scope is given to the man whose capacity consists almost entirely in being able to keep pegging away. But for all long-distance running the road to success consists in steady training, a quantity of work, and a rigid dietary.

Boys' Races.—A word should be added as to running races for boys. It should be almost superfluous to say that growing lads should not be put to so severe training as men. The best foundation for training with boys is to let them have plenty of games such as Cricket or Football. By these they harden the muscles and improve the wind. We are no believers in open races for boys. Every boy should be encouraged to run in his own school sports in classes with boys of his own age, but in these school sports there should not be many races of a long distance, and no long races at all for young boys, who so often have more energy and spirit than strength. Boys also should be encouraged at schools more than they are at present to practise the High and Long Jump and Pole Jump. They afford plenty of amusement and healthy rivalry and can do nothing but good, and it is as natural for a boy to leap as for a kitten to play. When jumping is taught in English schools, we shall see more and better jumping than is common in England at present.

MONTAGUE SHEARMAN.

STEEPLECHASING.—For many years past no athletic sports programme has been considered quite complete without a steeplechase, and at country meetings especially this event provides more interest and amusement than any other. One would naturally have assumed that such encouragement would attract a larger number of cross-country runners to this undoubtedly good sport; yet not only have steeplechases of recent years at athletic meetings produced as a rule thin fields, but the class of competitor, with a few exceptions, has been distinctly poor. The explanation may lie in the fact that steeplechasers have enough discomforts to put up with in any case, and are not prepared to make themselves ridiculous for the amusement of the crowd by being asked to take almost impossible jumps. To a considerable extent sports-managers have only themselves to blame for driving distance runners on to the flat.

A good steeplechaser must combine speed, endurance, and jumping ability, a combination which many of our cross-country runners possess to a marked degree, and which would bring them the highest steeplechasing honours if they turned their attention to the sport. The steeplechase course is generally laid out on a grass enclosure, and comprises a number of artificial obstacles placed at intervals of about eighty yards, generally in the form of hurdles, which should not be too difficult, say three feet in height and tipped with furze. The *pièce de résistance,* however, is the water jump, a ditch about six feet wide by two and a half feet deep, the approach to which is guarded by a solid structure such as a fence, more thickly studded with furze than the other hurdles, and which must be *cleared* and not rushed.

The favourite steeplechasing distances are from three-quarters of a mile to two miles, the amateur championship being at the latter distance.

It is surprising to note how few competitors take the obstacles scientifically—that is, fly and not jump them. The obstacles should be taken in the stride as in the hurdle-race, so that the runner alights on one foot and at once resumes his stride. The generality of steeplechasers jump the hurdles, often clearing them by several inches, thereby uselessly exhausting energy; but the real fatality of this method lies in the fact that the runner alights on both feet, coming practically to a dead stop and entirely getting out of his stride. It is evident that a recurrence of this at intervals of every eighty to one hundred yards is not only exhausting, but loses an immense amount of time, probably several seconds in a mile. There is no necessity to clear the ordinary hurdle, as, if the timber is topped, the furze will yield to the impact of the body. The chief attraction so far as the spectators are concerned, centres in the water jump, and it is here that the experienced steeplechaser is seen to greatest advantage. Unless he is a jumper of exceptional ability, he never attempts to clear the ditch, but jumps into the middle of the water with arms and body slightly bent forward so that he may grasp the edge of the ditch with his hands, and spring out with a minimum loss of time.

There is usually not wanting the competitor who seeks to arouse the enthusiasm of the spectators by clearing the water jump, but the effort is very exhausting, and the exhibition steeplechaser is not to be taken seriously, as he seldom finishes in the first three. The usual rule of athletics as to passing applies to steeplechasing, but special care is needed in approaching the water jump, particularly if the men happen to be in a cluster. It is an unwritten law that the man just behind has the courtesy, to use a mild term, to swerve in his jump either to the right or left, otherwise a serious spiking accident is likely to occur. So many qualities combine to produce a good steeplechaser, that it is to be regretted that more good men do not apply themselves to cultivate the art.

A steeplechase across country differs in many respects from that described above, but primarily in the fact that it is held over country supposed to be open, and the obstacles encountered are natural and not artificial. The courses naturally vary in accordance with the country traversed, but care should be taken to make them as varied as possible; and to apply the term "cross-country" to some courses, mainly consisting of road, is a misnomer. In the cross-country steeplechase of the present day it is seldom that hedges or gates are cleared, though vaulting is an extremely useful accomplishment, and should be more cultivated than at present. Most runners get through a gap in a hedge, or take a ditch very gingerly, whereas with a little more pluck and determination the obstacle could be negotiated much more quickly, and with less personal injury. Racing for a gap is quite legitimate, provided the holder does not wilfully hang back with the object of impeding those behind. Further hints on cross-country running have been already given in an article under that heading.

HAROLD WADE.

THROWING THE DISCUS has had a precarious existence in Greece since classical times, but cannot be said to have been con-formed to rule and formally introduced to the athletic world until the Olympic Games of 1896. Its obvious elegance deserved a better fate.

The discus is circular, having a diameter of 22 centimetres (about 8½ inches), and is composed of wood surrounded by a rim of iron. A nucleus of lead is let into the centre, bringing up the total weight to 2 kilogrammes (about 4½ lb.).

The performer stands in a square of two metres and holds the discus in both hands above his left shoulder. The fingers of the right hand grip it tightly by the upper edge; those of the left merely support it. The left leg is advanced. Then the body is swung half round to the right, so that the face is turned towards the discus, the latter having been brought round by the right hand to a position above and behind the performer's head. At the same time, the right leg is put forward. It is this attitude which is depicted in the celebrated statue of the "*Discobolos.*" The left leg is then brought swiftly to the front again, and the discus is hurled with all the swing of the body. The hand must at the moment of ejection be horizontal, so that the missile may traverse the air horizontally. The distance thrown at the Olympic Games was rather over 95 feet.

Throwing the Discus.

THROWING THE HAMMER has always suffered from diversity of rules. We need only concern ourselves with the present code, which compels the performer to throw from a circle of seven feet diameter. The American circle has a raised rim to keep the thrower safely in. The hammer must weigh 16 lb., must have a total length of not more than four feet, and the head and handle may be of any size, shape, or material. The Inter-University circle of thirty feet has now vanished, and may there-

Throwing the Hammer. Flanagan, Winner in the Olympic Games, 1908.

H. A. Leake, Winner A.A.A. Sports, 1909.

fore be dismissed, as may also the Scotch or stationary method, which is of very limited application. The performer stands generally with his back to the direction in which he wishes to throw, with the head of the hammer resting on the ground outside the ring beside him. He obtains the impetus required by whirling the hammer round above his head as many times as he deems necessary, keeping his feet quite stationary. When he has obtained sufficient swing, he brings his whole body round with a jump (some performers contrive to gyrate twice or even thrice within the circle, but this practice is not recommended), keeping his arms and the hammer as far outstretched as possible, and having thus arrived at the front edge of the ring, he discharges the missile. The cardinal points to be observed are (1) keeping absolutely stationary while getting the swing on the hammer, (2) rapidity in jumping round (most important of all), and (3) continuous command over the weapon, so that it may be thrown with the whole force of the body, and not merely with the arms.

G. S. ROBERTSON.

TUG OF WAR.—[*See* MILITARY SPORTS.]

WALKING, LONG-DISTANCE.—Of recent years walking has fallen into desuetude, and nowadays it is rare indeed to hear of feats of endurance approaching those of Captain Barclay or Mr. Ross. This is the age of hurry, and the fact of a man's being able to compass on the wheel fifteen miles an hour without any distress to himself, constitutes an incontrovertible argument in favour of the bicycle. At the same time, from the point of view of physical condition, there can be no comparison between the cyclist and the pedestrian, who, in six hours, while the former is travelling his seventy or eighty miles, is content to cover his twenty-five miles on foot.

The late Sir John Astley, one of the keenest of sportsmen, brought long-distance walking into great prominence a few years ago, when some wonderful performances were accomplished. Since his death, however, walking has relapsed into its former oblivion. Still, it is sure sooner or later to revive. Of track-walking the writer does not propose to treat. It is entirely for the benefit of amateurs who may feel inclined to attempt a long-distance walk that the following hints, the result of some experience, are intended.

WALKING RACE.

Patient and systematic training is the chief consideration: to get condition and keep it. Good feet are indispensable, and without them long-distance walking must never be attempted. Assuming, then, that the intending walker has naturally good feet, they must in addition be well cared for. It is the greatest mistake to suppose that a horny foot is durable in proportion. The skin should be supple and pliant. After the bath the feet must be thoroughly dried, well hand-rubbed, then soaped all over. Some advocate soft soap, but good brown soap is preferable. The socks, too—lambswool is the best material—should be well soaped. Strong shooting boots or shoes are to be recommended, having a long, low heel, with plenty of nails (but large nails are a mistake) at the toes and sides. It is also well to bear in mind the maxim "The heavier the man, the stronger the boot." Flannel underclothing is indispensable.

Training.—The preparation should be gradual. The man who attempts only fifteen miles on the first day will at the end of a week cover thirty with infinitely greater ease. The feet must, on returning home, be the first care. Excessive tubbing is not recommended; it is far better to rub them well first with a damp towel and then with a dry one, followed by more hand-rubbing. Regular hand-rubbing also for the legs, back, and loins is the great secret of keeping in condition.

Diet.—A man in really hard work can eat anything. The less he drinks, no matter what the liquor, the better; and the sounder his condition, the less thirsty he will feel. During the early days of training, a man naturally perspires a great deal, becoming, in consequence, very thirsty, a craving that should, however, be fought down. It is an excellent plan to rinse the mouth with water. Sluicing the arms up to the elbows in water will also be found to relieve the thirst to an almost incredible degree; and water which is not fit to drink may still be utilised by standing in it above the ankles for a few minutes. The feet will soon dry, and if the pedestrian keep going, he will suffer no ill effect.

As a practical instance of a long-distance walk, the writer undertook on one occasion to walk from Derbyshire to the north of Perthshire, a distance of 347 miles, in a week. He had trained, it is true, to a certain extent, though not by any means as carefully as he would now, were he fit to undertake what he then accomplished. At the end of the first day, after he had covered fifty-eight miles, his feet went completely to pieces, which may be partly attributed to the fact that for the last seventeen miles the road was paved with great cobblestones. The second day, on which he started in acute pain, put another forty-six miles to his credit; on the third his feet gradually improved, and he ultimately arrived at his destination with three and a half hours to spare.

FRED COTTON.

WEIGHT PUTTING.—The weight should weigh 16 lb., and in England must be of iron. It is put by A.A.A. rules out of a seven-foot circle, in America with a raised rim. The put used to be measured in England along a perpendicular, from the pitch of the shot to the side, or side produced, of a seven-foot square; consequently crooked putting was then disadvantageous in England.

PUTTING THE WEIGHT.

Excellence in shot-putting, as in hammer-throwing, depends entirely on the capacity to bring the weight and strength of the body to bear upon the missile. To acquire this, the elbow of the arm which supports the shot, should be kept directly below the hand,

OLYMPIC GAMES, 1908. RALPH ROSE, WINNER.

and the hand close to the shoulder, which it should not leave till the very instant of discharge. Further, the performer should stand sideways to the intended direction of his put, keeping the right shoulder and the shot well back, and being careful to rest the whole weight of shot and body on the right leg. The left leg is raised and held in front to balance the body. A hop forward is taken in this position, the right shoulder being kept as far back as ever; then by a rapid twist of the whole body, the right side and leg are brought to the front, and the shot is propelled. This twist corresponds to the circular jump in hammer-throwing; and in both cases, rapidity and the continuous application of all available strength and weight to the missile are of the highest importance.

G. S. ROBERTSON.

GLOSSARY.

Amateur Athletic Association.—The A.A.A. was founded at Oxford on April 24th, 1880, when the representatives of the chief clubs met and formed a federation. It is the governing body in all athletic matters, and every athletic meeting must be held under its rules. It has taken the place which the Amateur Athletic Club, founded in 1866, tried, but failed, to fill. All the championship contests are now held under its supervision. [*see* Rules *infra.*]

Cinder-track.—A running or cycling path made as follows: The surface is dug out to the depth of 12 or 18 inches, according to the soil. Some 6 to 8 inches are then filled with brick rubbish or large gravel. Above this are placed 3 or 4 inches of rough cinders or clinkers, and finally 3 inches of fine cinders. Amongst famous running tracks are, or were, in London, Stamford Bridge, Lillie Bridge, Catford Bridge, and Queen's Club; Aston Manor at Birmingham; Iffley Road at Oxford, and Fenner's at Cambridge.

Consolation Race.—A race at the close of an athletic meeting, for which all may enter without extra fee who have competed in previous events but have failed to win a prize. The character of the race varies, but it is usually a sprint of 220 yards.

Corks.—Small cylinders, usually, but not always, made of cork, held in the hand to enable the fist to be clenched without straining the fingers or palms.

Dead-heat.—The result of a race in which two or more competitors reach the finish exactly together.

Event.—A completed race, including preliminary *Heats* (*q.v.*), which are not in themselves "events."

Final.—[*See* HEAT.]

Flights.—Each leap that has to be taken over a hurdle, and, therefore, by extension, each hurdle, is sometimes called a flight. In the ordinary hurdle race there are ten flights.

Fly.—To take the hurdles in the stride without pausing, in contradistinction from jumping them.

Foul.—A wilful jostling, crossing, or obstructing of one competitor by another. Also used as a verb. [*See* Law 18.]

Hand-spring Start.—A method of starting only employed in the shorter races. The competitor stands, or rather crouches, with his fingers, or corks, upon the line and his feet and body behind it. The first in England to succeed with it was T. L. Nicholas, of Monmouth, the champion quarter miler of 1890.

Handicap.—(1) The start which a man gives to another or receives from him. (2) A race in which men receive or give starts. Contrasted with *Scratch Race* (*q.v.*). (3) As verb, to assign starts to competitors in proportion to their capacity.

Heat.—A division of a race in which the competitors are too numerous to run all at once. The race is decided eventually by the winners (or winners and seconds) running together in a Final Race or Heat.

Heel and Toe.—A description of fair walking, in which the heel of the walker comes to the ground before the toe. It is also sometimes used in a sense equivalent to that of the old "*Toe and Heel,*" which meant that "as the foot of the back leg left the ground and before the toes had been lifted, the heel of the foremost foot should be on the ground."

Lap.—One complete circuit of the track.

Lifting.—Unfair walking, the toe of the back foot coming up before the front heel is down.

Limit Man.—The competitor with the longest start in a handicap race.

London Athletic Club.—The L.A.C. was founded under another title in 1863, but in 1866 took its present name. Its headquarters are at Stamford Bridge.

Marksman.—The official who is responsible for placing competitors upon the proper "mark," which shows their start and the point from which they race.

Mixing.—A deliberate attempt to put in a few running strides when in a walking race. To be distinguished from "Lifting," which may be accidental.

Novice.—A competitor is a novice if he has never won a prize in the *class* of event for which he is competing, *e.g.,* a quarter-mile champion might be a novice at a walking race, but not in a mile race, even though he had never before run the distance.

Pacing.—Going in front so as to quicken the speed at which the race is being run, or at which some particular competitor is running.

Penalise.—Strictly speaking, a penalty is a minus handicap, *i.e.,* the man who is giving the other competitors starts, is placed behind the line from which the distance to be run is reckoned. This method of handicapping is usually employed towards previous winners, and is most common in hurdle races.

Pit.—The space hollowed out beyond the board which limits the *Take-off* (*q.v.*) in the Long Jump. The result is that if the competitor overrun the line, he cannot get a jump at all.

Run-in.—The distance from the last hurdle to the finish of the race.

Scratch Line.—The mark from which the length of any race is measured.

Scratch Man.—The competitor who gives starts, but receives none from any. Often called simply "Scratch."

Scratch Race.—A race in which no competitor gives or receives a start.

Shot.—Another name for the Weight.

Shot.—A man is said to be "shot on the post" when a competitor just dashes by him as he eases for the finish, or fails from exhaustion.

Side Stride.—The common method of taking the High Jump, which consists of running from the side and getting one leg over before the other.

Spin.—A practice run.

Sprint.—(1) A race whose whole distance can be run at full speed, including the 100 and 220 yards, and, in some opinions, the quarter mile. (2) As verb, to run for a little way at top speed, not only in a short race, but even in a long one, in order to pass or dishearten an opponent.

Standard.—The time or distance assigned to each event at a championship meeting, by beating which a competitor becomes entitled to a medal.

Straight.—The section of the track between the last bend and the winning post.

Strings.—(1) In a hundred yards' race the competitors run side by side between strings fastened to stakes along the course. The width between the strings must not be less than 4 feet, and the stakes not less than 30 feet apart. [*See* Law 33.] (2) "First," "second," and "third" strings are the first, second, and third men chosen to represent a club in any event.

Take-off.—The spot from which a competitor rises for the high, or long, jump. The term is also used sometimes for the style of rising from the spot.

Tape.—The line held across the track at the winning post, which competitors must touch. It is now general to fasten a thread from side to side, which is broken by the leader. Frequently called the "*Worsted.*"

Waiting.—Running behind another man, allowing him to make the pace, and reserving the energies for the finish.

RULES FOR ALL COMPETITIONS UNDER A.A.A. LAW.

Qualification of Competitors.

1. Every competition under these Rules shall be confined to amateurs, as defined by the Association, and no one shall be entitled or allowed to compete unless he is an amateur according to the definition adopted by the Association, namely:—

> "An Amateur is one who has never competed for a money prize or monetary consideration, or for any declared wager or staked bet; who has never engaged in, assisted in, or taught any athletic exercise as a means of pecuniary gain; and who has never taken part in any competition with anyone who is not an amateur."

To this definition the only exceptions allowed are as follows:—

(*a*) That Amateur athletes shall not lose their amateur status by competing with or against professionals in Cricket matches or in ordinary Club Football matches for which no prizes are given, or in Cup Competitions permitted by the National Football Associations or National Rugby Unions of England, Ireland, Scotland, or Wales, providing that such competitions or matches form no part of, nor have connection with any Athletic Meeting.

(*b*) That Competitions-at-arms between Volunteers and Regulars shall not be considered as coming within the scope of the A.A.A. Laws.

(*c*) That Competitors in Officers' Races at Naval and Military Athletic Meetings (such races being for officers only, and for which money prizes are not given) shall be exempt from the laws of the A.A.A. disqualifying runners for competing at mixed meetings.

(*d*) That the "Championship of the Army" Races be exempt from the effect of this Rule.

(*e*) That a paid handicapper is not *ipso facto* a professional.

(*f*) That those Sailors and Soldiers of His Majesty's Forces (including the Territorial Army), who do not individually accept money prizes, be exempt from the loss of their amateur status by reason of competing in Naval and Military Competitions confined to Sailors and Soldiers.

2. No one shall be eligible or allowed to compete in any competition under these Rules while his amateur qualification or his right to compete is suspended, by, or on behalf of, or under any rule or bye-law of the Association, or any of the following bodies, namely:

(*a*) Northern Counties Athletic Association; (*b*) Midland Counties A.A.A.; (*c*) Southern Committee of the A.A.A.; (*d*) National Cyclists' Union; (*e*) Amateur Swimming Association; (*f*) Amateur Gymnastic Association; (*g*) Amateur Boxing Association; (*h*) National Amateur Wrestling Association; (*i*) Scottish A.A.A.; (*j*) Irish A.A.A.

MARTIN SHERIDAN, WINNER OF THE DISCUS (GREEK STYLE), OLYMPIC GAMES, 1908.

No one who has at any time since the 31st day of March, 1885, competed in the United Kingdom in any athletic competition, which was not held by a club or society affiliated to or registered by the Association, or by the Scottish A.A.A. or the Irish A.A.A., or held by a club affiliated to the N.C.U., shall be eligible to compete in any competition held under these Rules, unless previous to the date of the competition in which he proposes to take part, his disqualification shall have been removed by some duly authorised body.

That after the first year, every competitor in open races under A.A.A. Laws must be a member of an affiliated club, or of a club which is a member of an affiliated Association or kindred body recognised by the A.A.A. Competitors in local, closed, or Scholars' and Veterans' events to be exempt.

3. When a competitor is a member of two or more clubs, the club which can show the longest unbroken period of his present membership has first-claim upon his services. In any Inter-Club contest under A.A.A. Rules, each competitor must have been a first-claim member of the club he represents at least three months prior to the race; and in the event of his residing more than twenty miles from the headquarters of his club, he must have been a first-claim member for one year immediately prior to the race. First-claim membership of School, College, University, Business House, purely Walking, or any non-pedestrian club, shall not debar a man from competing for his second-claim club under this rule, except when his first-claim club is competing in the race. An unattached competitor on joining a club for the first time may compete for that club immediately.

4. In Inter-Club contests ineligibility of an individual competitor shall not disqualify his club, but the competition shall be decided as if the ineligible competitor had not been entered or taken part therein.

5. That in Team and Relay Races, no one shall be allowed to compete whose name does not appear in the Programme for that event, either as a member of the team, or one of the reserves of that team.

That in all Relay Races, there shall be allowed one reserve man for each section of the race.

That in all Team Races, each club shall be allowed to enter twice the number entitled to score.

6. A competitor in athletic competitions (other than A.A.A. Championships or bona fide International, Inter-Club, Inter-Team, Inter-College, or Inter-School contests), who asks for or receives hotel, travelling, or other expenses ceases to be an amateur, and no Club, Society, or Managing Body promoting any athletic competition shall, either directly or indirectly, pay or offer a monetary consideration to, or the hotel, travelling, or other expenses of any competitor in such competition. Clubs may only pay the expenses of their first-claim members in contests under this rule.

Clubs, Colleges, or Schools shall be answerable for any payments made by them, and if called upon to do so shall produce full details of the same and accounts to the A.A.A. (North, South, or Midlands) Committee.

7. Competitions for Boys, other than competitions for members of a particular club or society, or their sons, shall be confined to boys under 15 years of age at the date of the competition, who have for three calendar months immediately preceding the same date, resided within a radius of three miles from the ground of competition; but this Rule is not to apply so as to exclude on the ground of non-residence any boy attending school and competing within a radius of 20 miles from Charing Cross, London.

8. A race advertised as a Novice Race, shall be confined to those who, at the time of competing, have never won a prize in a similar class of competition—*i.e.*, winning a prize for walking would not disqualify for running or *vice versa*, but winning a prize for running any distance would disqualify for running, and no race shall be promoted as a novice race unless it complies with this Rule.

Prizes.

9. No cheque on a tradesman or similar value prize shall be offered or taken as a prize in any competition, and in no case shall an alternative of money or prize be offered or taken.

10. No prize shall be offered in a handicap of greater value than £10 10*s*. (This is limited to £5 5*s*. in the Southern District.)

11. When the value of a prize is advertised, the exact amount paid after deducting any discount allowed, shall be considered the actual value of the prize.

12. Every prize which is offered for competition at an athletic meeting shall be publicly presented on the ground on the day of the meeting.

13. Every objection by a competitor to the value of a prize shall be made to the Secretary of the A.A.A. district within which the prize was won, and shall be accompanied by a deposit of 5*s*., which shall be forfeited to the District Association, if the objection is considered unreasonable.

14. Every prize offered for competition, and awarded to a successful competitor, shall be deemed and taken to be so offered and awarded subject to such competitor being eligible to compete, and to the statements made in his entry form being strictly accurate and complete, and the fact that a competitor has been awarded or received a prize, shall give him no claim to it, should it be subsequently shown that he was not eligible to compete, or that any of the statements made in his entry form were inaccurate or incomplete, and any competitor who shall have received a prize to which he was not entitled shall return it forthwith on being required to do so.

Advertisements and Notices.

15. Every advertisement, prospectus, entry form or programme shall state that the meeting or competition is held "under the Laws of the Amateur Athletic Association," and every entry form shall have printed on it the definition of an amateur, adopted by the Association.

16. Every club or society affiliated to the Association shall state in their advertisements, prospectuses, and programmes that they are so affiliated, and every club, society, or managing body to which a permit has been granted shall so state that a permit has been granted, and shall exhibit the permit on the day of the meeting in a conspicuous place in the competitors' dressing-room. All Open Betting must be put down, and a notice prohibiting betting must be conspicuously exhibited at or near the entrance or entrances to all Sports Enclosures.

Programme.

17. Every programme shall have printed therein a copy of the rules regulating penalties, and also any scale of penalties for the time being in force. (*See Scale, page* 33.)

Every programme shall state:—

(*a*) The value of each prize offered for competition, if previously advertised.

(*b*) The name of the person from whom each handicap event has been framed by the handicapper.

(*c*) The name and club, or, if unattached, the place of residence, of each person whose entry has been accepted, and the handicap mark or time allowance (if any) of such person.

(*d*) The age in years and months of each boy entered in any competition for boys.

(*e*) The date stated by the handicapper to be the date on which the handicaps were made.

18. As soon as possible after the day on which any competition is decided, a programme shall be marked by the Secretary so as to show the winner of every trial heat and the placings in every other round and final of the events decided under A.A.A. Laws, which shall be sent to the Secretary of the A.A.A. District within which the competition is decided; or such other official of the district as may from time to time be entitled to the custody thereof under the regulations of the district.

23. Every entry shall be made in the real name of the intending competitor, and this name shall appear on the programme.

24. Every entry shall be made to the Secretary or other authorised officer of the meeting or competition, and entries made to the handicapper shall be void.

25. No entry shall be tendered or accepted without the full amount of the stipulated entrance fees.

26. No entry from a Boy who will be under 15 years of age at the date of competition shall be tendered or accepted for any competition which is not confined to Boys or to members of the Club or Society promoting the meeting or competition.

G. V. Lemming (Sweden), Winner of the Javelin Throwing, Olympic Games, 1908.

19. Every such programme shall be filed, and be open for inspection by amateur athletes at all reasonable times.

20. In all cases where Cycle Races are included in the programme of an athletic meeting, a similar programme as to Cycle events shall also be sent to the Secretary of the N.C.U. Local Centre of the district in which the meeting was held.

Entries.

21. Every Club, Society, and Managing Body promoting an athletic meeting or competition, shall have the right to refuse any entry or entries, without being bound to assign a reason for such refusal.

22. No entry shall be made or accepted unless a form of entry, authorised by the Association, be used.

27. Every entry for a handicap competition shall be dated and shall state fully and accurately such particulars as to the previous performances of the intending competitor as may from time to time be required by the official form of entry of the Association.

28. Every entry for a Boys' or Veterans' race shall state the date of birth, present age in years and months, of the intending competitor, and, as regards Boys' races, the number of prizes won by him; and every such entry shall, if required, be verified by the production of a birth certificate.

29. Every entry shall be signed by the intending competitor himself, and he shall be responsible for all statements therein and any omissions therefrom, whether he actually made the entry or not.

30. No one shall be entitled or allowed to be handicapped unless his entry form is filled up in

accordance with the requirements of the Association, and anyone whose entry form is not so filled up shall forfeit any entrance fees paid by him.

Handicapper.

31. Except as herein provided, every handicap event which is not confined to the members of a particular Club, School, or College, or to Boys, or to the employees of a particular business firm, or company, shall be handicapped by one of the Official Handicappers of the Association.

Where, however, a handicap event is promoted in a rural and non-populous district, and confined to residents within a particular radius not exceeding ten miles, and in any case in which the event is confined to members of the Police Force of any particular city, town, or county division, or is promoted by a *bona-fide* Cross-Country Club or Association, and is held between November 1st and March 1st, the Association may, on special application, sanction the employment of handicappers who are not official handicappers of the Association.

Steeplechasing, Olympic Games, 1908.

32. Every handicap event, which is not an event open to all amateurs, and whether it is required to be handicapped by an official handicapper or not, shall be framed from the best man in the competition, and he shall be placed on the scratch mark.

Time Standards shall be fixed for all open handicaps.

33. Every handicap shall be signed by the handicapper, and shall have stated on it the date on which it was made.

34. No one shall be entitled or allowed to compete in any competition unless his name is printed on the programme, nor in a handicap event unless the name and handicap mark or allowance are so recorded.

35. Every competitor must wear complete clothing from the shoulder to the knees (*i.e.*, jersey sleeved to the elbows and loose drawers with slips), and in any event in which a water-jump is included the drawers and slips must be dark in colour. Any competitor will be excluded from taking part in the Sports unless properly attired. A copy of this Rule shall be placed in a conspicuous place in the competitors' dressing-room at every Athletic Meeting.

36. No one liable to be penalised under Rule 50 shall be entitled or allowed to compete in any competition except from his penalty mark, and everyone so liable to be penalised shall, before taking part in a competition, notify one of the Judges or the Starter, in writing, of any penalty or penalties incurred by him, and of the mark off which he proposes to compete.

37. No person, other than the handicapper, shall at any time alter any handicap mark or allowance allotted by the handicapper, unless such alteration is required to give effect to any rule as to penalties or to correct a clerical or printer's error.

38. (*a*) No person shall be entitled or allowed to compete in any trial heat other than that in which his name is printed on the programme, and no made-up, late, or supplementary heat shall be permitted under any circumstances.

(*b*) The winners of trial heats must compete in the finals unless the consent of the Judges to their abstention has been obtained, or they become liable to suspension.

39. (*a*) In handicap races, stations at the start shall be assigned to the competitors according to the order of their handicap starts, the competitor with the shortest start taking the first, or inside, station, the competitor with the next shortest start the second station, and so on.

(*b*) In level races, the competitors shall ballot for their respective stations at the start, and each competitor shall take the station assigned to him by the ballot.

(*c*) No competitor shall be entitled or allowed to compete in any competition except from the station assigned to him under the provisions of this Rule.

40. No attendant shall accompany any competitor on the mark or in the race, nor shall any competitor be allowed, without the permission of the Referee or Judges, to receive assistance or refreshment from anyone during the progress of a race.

41. All races (except time handicaps) shall be started by the report of a pistol, and a start shall only be made to the actual report.

42. All questions as to the starting of a race shall be in the absolute discretion of the Starter, whose decision shall be final.

43. The Starter shall place the competitors on their respective marks in their respective stations, and shall for this purpose have the assistance of such marksmen as may be necessary.

44. No competitor shall touch the ground in front of his mark with any part of his body.

45. (*a*) If after being placed on his mark any competitor shall overstep such mark before the pistol has been fired, the Starter shall in handicap events put him back one yard where the distance of the race does not exceed 220 yards; two yards where the distance exceeds 220 yards but does not exceed 440 yards; three yards where the distance exceeds 440 yards but does not exceed 880 yards; and five yards where the distance exceeds 880 yards. For a second offence in the same competition, the Starter shall impose a further similar penalty, and for a third offence shall disqualify the competitor and exclude him from the race.

(*b*) In level races the before-mentioned penalties shall be imposed by the Starter at his discretion.

46. Any competitor wilfully jostling or running across or obstructing another competitor so as to impede his progress shall forfeit his right to be in the competition, and shall not be awarded any position or prize that he would otherwise have been entitled to.

47. No competitor shall be allowed to rejoin a race after leaving the track, either for the purpose of gaining a place, or to pace or assist another competitor.

48. (*a*) Every competitor shall be supplied with and wear during competition a distinctive number corresponding to his number in the programme.

(*b*) In races not exceeding 300 yards duplicate numbers shall be provided and worn, one on the breast and the other on the back.

49. In sprint races run over a stringed track with more than one round of preliminary heats, the winners only of the first round of the heats shall be entitled to take further part in any race.

Penalties.

50. The winner of the first prize in any handicap event which is not an event confined to the members of a particular club, school, or college, or to the employees of a particular firm or company, shall be penalised according to the scale of penalties attached to these Rules, in all handicap events to which the scale applies, and for which he may have made an entry previous to winning such first prize; but no penalty shall be enforced a second time where the programme of a competition states that it has already been imposed by the handicapper in framing the handicap.

The Conduct of the Meeting.

51. (*a*) Every club, society, or managing body promoting an athletic meeting or competition shall provide sufficient and convenient accommodation for the competitors taking part therein, and shall take all such steps as may be necessary to reserve such accommodation for the exclusive use of competitors and a limited number of other persons to be authorised by the Secretary in writing, to attend on competitors.

(*b*) Where a competition for boys is included in the programme of an athletic meeting, separate dressing accommodation shall always be provided and reserved for the boys taking part therein.

52. All open betting shall be suppressed.

Protests.

53. (*a*) Any protest or objection by a competitor against another competitor, or against another competitor's qualification to compete, shall be made to the Referee or Judges, when practicable before, and in any case as soon as possible after the competition is decided, and before the prizes are presented.

Tug-of-War, Olympic Games, 1908.

(*b*) Every such protest or objection shall be accompanied by a deposit of 5s., and shall when required be made in writing signed by the objector, and if upon investigation the protest or objection shall appear to have been made on no reasonable ground the deposit shall be forfeited to the District Association.

(*c*) In the event of a protest or objection being lodged against a successful competitor, his prize shall be withheld until the protest or objection shall have been finally disposed of in the manner provided in the next Rule. If, within a period of three months from the date of competition, the protest or objection shall be sustained, the prizes shall be awarded as if the competitor objected to had not taken part in the competition.

(*d*) Any protest or objection which has reference to the conduct of a competitor in the actual competition, shall be decided by the Referee on the ground and his decision shall be final. The

Referee may also decide any other protest or objection, but if his decision is objected to at the time he shall be required to refer the matter to the District Association for final decision. The fee deposited with any protest or objection decided by the Association shall, if forfeited, belong to the District Association.

The High Jump and Pole Jump.

54. Each competitor shall be allowed three jumps at each height. Crossing the scratch without displacing the bar shall not count as one jump. All measurements shall be made from the ground to the centre of the bar. In the High Jump neither diving nor somersaulting shall be permitted. The cross-bars shall be of wood only, of a uniform thickness throughout, and without weights. The maximum projection of the pegs shall be 3 inches from the uprights. The ends of the cross-bar shall not project more than six inches from the pegs. In any competition each competitor shall be allowed to commence jumping at any height he desires, but having commenced he shall continue attempting each height as the bar is raised, until he either fail three times or retire. In the pole jump three attempts, even if the cross-bar be not displaced, shall count as one jump.

The Broad Jump.

55. Each competitor shall be allowed three jumps, and the best three competitors of the first trial shall be allowed three more tries each for the final. The farthest jump of *all* shall win. If any competitor fall back or step back, after jumping, or crosses the taking-off line with either foot, or so swerves aside that he pass beyond the taking-off line, such jump shall not be measured, but it shall be counted against the competitor as one jump. All jumps shall be measured to the taking-off line from the edge of the heel-mark nearest that line, along a line perpendicular to that line. The taking-off line shall, *where possible,* be of wood, 5 inches wide, and not less than 2 ft. 6 in. long, and shall be sunk flush with the ground. The ground shall be removed to the depth of 3 in., and the width of 12 in. in front of the taking-off line.

In matches and inter-club contests the provisions for Throwing the Hammer, Putting the Weight, and Broad Jump may be modified in such manner as may be agreed upon prior to the competition being started.

Steeplechasing.

56. For Steeplechases the hurdles shall not be higher than 3 ft. Every competitor shall go over or through the water; and anyone who jumps to one side or the other of the water jump shall be disqualified.

Throwing the Cricket Ball.

57. In throwing the Cricket Ball all throws shall be measured perpendicularly from the first pitch of the ball to the scratch line, or that line produced; and the thrower, in delivering the ball, shall not cross such scratch line. Three tries only shall be allowed, and crossing the scratch shall count as one try.

Tug-of-War.

58 (*a*) The teams shall consist of equal numbers of competitors. The rope shall be of sufficient length to allow for a "pull" of twelve feet, and for twelve feet slack at each end, together with four feet for each competitor; it shall not be less than four inches in circumference, and shall be without knots or other holdings for the hands. A centre tape shall be affixed to the centre of the rope, and six feet on each side of the centre tape two sides tapes shall be affixed to the rope. A centre line shall be marked on the ground, and six feet on either side of the centre line two side lines parallel thereto. At the start the rope shall be taut, and the centre tape shall be over the centre line, and the competitors shall be outside the side lines. During no part of the pull shall the rope be tied.

(*b*) The start shall be by word of mouth. During no part of the pull shall the foot of any competitor go beyond the centre line. A pull shall be won when one team shall have pulled the side tape of the opposing side over their own side line. No competitor shall wear prepared boots or shoes, or boots or shoes with any projecting nails, tips, sprigs, points, hollows, *or projections* of any kind. No competitor shall make any hole in the ground with his feet, or in any other way before the start. No competitor shall wilfully touch the ground with any part of his person but his feet. If the competition is for teams limited in weight, each competitor shall be weighed before the start. All heats shall be won by two pulls out of three.

Track Measurements.

59. Every track shall be measured twelve inches from the inner side of the path.

Entry Forms.

60. Clubs shall be required to keep for twelve months all entry forms received.

Officials.

61. That in every competition there shall be provided by the promoting body the following Officials, viz.:—

(*a*) a Secretary or Secretaries.

(*b*) A Committee in whose hands shall be placed all matters which do not relate to the actual conduct of the meeting or competition.

(*c*) Two or more Judges, who shall be responsible for seeing that the proper distance of a race is covered, and who shall decide the order in which the competitors finish in the competition.

They shall also have power to declare a race void or order it to be re-run, if in their opinion the conduct of the competitor or competitors has prevented the race being properly contested.

(*d*) A Referee who shall decide in the event of a difference of opinion between the Judges. The decision of the Referee shall be final in all cases.

(*e*) Two or more Starters, or Clerks of the Course, whose business it shall be to call out the competitors for each event, and to assign to each his distinctive number or numbers.

(*f*) One or more Marksmen.

(*g*) A Starter.

(*h*) Two or more Timekeepers.

For Walking Races, two or more Judges of walking, who shall have power to appoint such assistants as they may deem necessary, and to whom, and their assistants, shall be left the decision of all questions affecting the competition, and they may at their discretion caution or disqualify any competitor whose walking they shall consider unfair, and remove or cause to be removed from the track any competitor who shall not at once leave the track on being disqualified.

Jurisdiction of the Association.

62. Every club, society, and managing body promoting an athletic meeting or competition under these Rules, and every person tendering an entry for any such meeting or competition (whether such entry is accepted or not), shall be deemed to have submitted to the absolute power, authority, jurisdiction, and decision of the Association on all questions which may arise concerning the application, construction, meaning, or effect of the Laws of the Association or these Rules, and no club, society, managing body, or person affected by a decision of the Association shall have any right of objecting thereto, or to the publication thereof, which is not conferred by the Laws of the Association or these Rules.

63. In the application of these Rules to the districts defined in Law 30 of the Association, all matters within the power, authority, or jurisdiction of the Association shall be assigned to and decided by the Northern Counties' Athletic Association, the Midland Counties A.A.A., and the Southern Committee of the A.A.A. respectively, subject to such right of appeal to the General Committee of the A.A.A., as may from time to time be permitted or provided for.

64. The Northern Counties' Athletic Association, the Midland Counties A.A.A., and the Southern Committee of the A.A.A. shall also have full power, authority, and jurisdiction in their respective districts to enforce, as part of these Rules, any by-laws and regulations from time to time made by them under the authority conferred by the Laws of the Association.

(2) Recommendations.

In addition to the foregoing, the following Rules for Competitions and the Management of Athletic Sports, adopted by the Amateur Athletic Association, are recommended to Clubs holding Sports under the Laws of the A.A.A.:—

As to the Conditions of Particular Competitions.

64. That Straight Sprint Races shall be run on a part of the cinder path or grass so staked and stringed that each competitor may have a separate course. The width between the strings shall not be less than four feet, and the stakes shall not be less than thirty feet apart.

65. That the Hurdle Race shall be over ten flights of hurdles on a level grass course of 120 yards straight. The hurdles shall stand 3 ft. 6 in. from the ground, and shall have level top-rails, and shall be placed 10 yards apart. The first flight of hurdles shall be 15 yards from scratch. Each competitor shall have his own line of hurdles and shall keep to that line throughout the race.

66. That the head and handle of the Hammer may be of any size, shape, and material, provided that the length of the complete implement shall not be more than 4 ft., and its weight not less than 16 lb. The competitor may assume any position he chooses, and use either one or both hands. All throws shall be made from a circle 7 ft. in diameter. Each competitor shall be allowed three throws, and the best three competitors of the first trial shall be allowed three more throws each. The farthest throw of *all* shall win. All distances shall be measured from the circumference of the circle to the first pitch of the hammer along a line drawn from that pitch to the centre of the circle. Foul throws and letting go of the Hammer in an attempt, shall count as trial throws.

67. That the Weight shall be put from the front of the shoulder with one hand only, and without follow from a 7ft. circle in diameter. The weight shall be of iron and spherical, and shall weigh 16 lb. All puts shall be measured from the circumference of the circle to the first pitch of the weight along a line drawn from that pitch to the centre of the circle. Each competitor shall be allowed three puts, and the best three competitors of the first trial shall be allowed three more puts each. The farthest put of *all* shall win.

68. That in Throwing the Hammer and Putting the Weight crossing the scratch shall count as a try.

69. That no prospectus of an athletic meeting or competition to be held under these Rules be issued or published until a printer's proof thereof, and of any entry form to be issued therewith, shall have been submitted to, and approved of by the Representative Committee of the A.A.A. District within which the proposed meeting or competition is to be held.

70. That an advance copy of the Programme of every athletic meeting or competition be forwarded by post to each intending competitor, to the address given in his entry, not later than the day before the day appointed for the meeting or competition; or that so much of the programme as will show the entries for and the starts (if any) allotted in each event be advertised the day next before the day appointed for the meeting or competition in one of the public papers circulating in the district of the proposed meeting or competition.

RECORD RULES OF THE AMATEUR ATHLETIC ASSOCIATION.

1.—A record can only be made in a *bona-fide* competition (either level or handicap) which has been duly fixed and advertised before the day, and is included in the printed programme, together with the names of the entrants for the event.

2.—No one, whether entered or not, may join in the competition after it has been started.

3.—In foot races the times must be taken by two or more competent timekeepers, the watches must be proved to be accurate, and the course measured (12 in. from the inner edge of the track) by a surveyor or qualified member of the Association.

4. In competitions other than foot races, the distance must be measured at the time and certified by a surveyor or qualified member of the Association.

5.—Timekeepers must exhibit their watches to the Referee and Judges if called upon immediately each race is completed.

Rules for 300 Yards and 440 Yards Level Hurdle Races on Grass.

1.—No record can be made on any track that does not comply with the following conditions.

2.—There shall be 10 flights of hurdles in each distance.

3.—Each competitor shall keep his own flight of hurdles throughout. Hurdles to be 3 ft. out of the ground, with straight top bars.

4.—Each track of hurdles must be measured the correct and full distance to the winning post.

In 300 Yards Races.

5.—The first hurdle shall be 45 yards from each competitor's scratch mark, and the remaining hurdles shall be as near as possible 25 yards apart. The distance from the last hurdle to the winning post shall be 30 yards.

In 440 Yards Races.

6.—The first hurdle shall be placed 50 yards from the competitor's scratch mark, and the remaining hurdles shall be as nearly as possible 40 yards apart, and the distance from the last hurdle to the winning post shall be 30 yards.

7.—The last 75 yards, if possible, must be straight.

It is recommended that any claim for a Record should be made within 14 days from the date it was made or performed.

TERMS OF AGREEMENT WITH THE NATIONAL CYCLISTS' UNION.

January 16th, 1886, passed at the Annual General Meeting, March 27th, 1886.

The following Rules must be observed at all Athletic Meetings where Cycling Events are included in the Programme.

1. All Sports and Festivals throughout England and Wales advertised and carried out as Athletic Sports shall, as regards the general conduct of such Athletic Meetings, be under the Laws and control of the A.A.A., but all Cycle Races competed for at such meetings shall be run under the rules and regulations of the N.C.U., and any competitor in such races shall, as regards his entry, and whilst actually competing in any such Cycle Race, be amenable to the N.C.U., as regards all future suspension or disqualification.

2. On the other hand, all Sports and Festivals advertised and held as Cycle Meetings shall, as regards their general conduct, be under the control of the N.C.U., but all Foot Races, or other descriptions of Athletic Sports as at present understood, shall be competed for under the Laws and Regulations of the A.A.A., and any person offending as to his entry or conduct whilst actually competing shall, as regards all future punishment, be dealt with by the A.A.A.

3. The decision of the Judges or Referee at all Athletic Sports or Joint Meetings to be final, and without appeal to either Association.

4. The N.C.U. also undertake not to sanction any professional Cycle Races at any meeting where Foot Races or other Athletic Sports are to be competed for.

5. In cases where Cycle Races shall be held under N.C.U. Rules at meetings held under the management of clubs affiliated to the A.A.A., the N.C.U. will not (except at the invitation of the A.A.A. club) make any order upon the Committee of the A.A.A. club to alter their decision upon any matter in which the Committee of that club have already adjudicated.

6. All joint Race Meetings shall be advertised to be, and shall be held under the rules of both Associations.

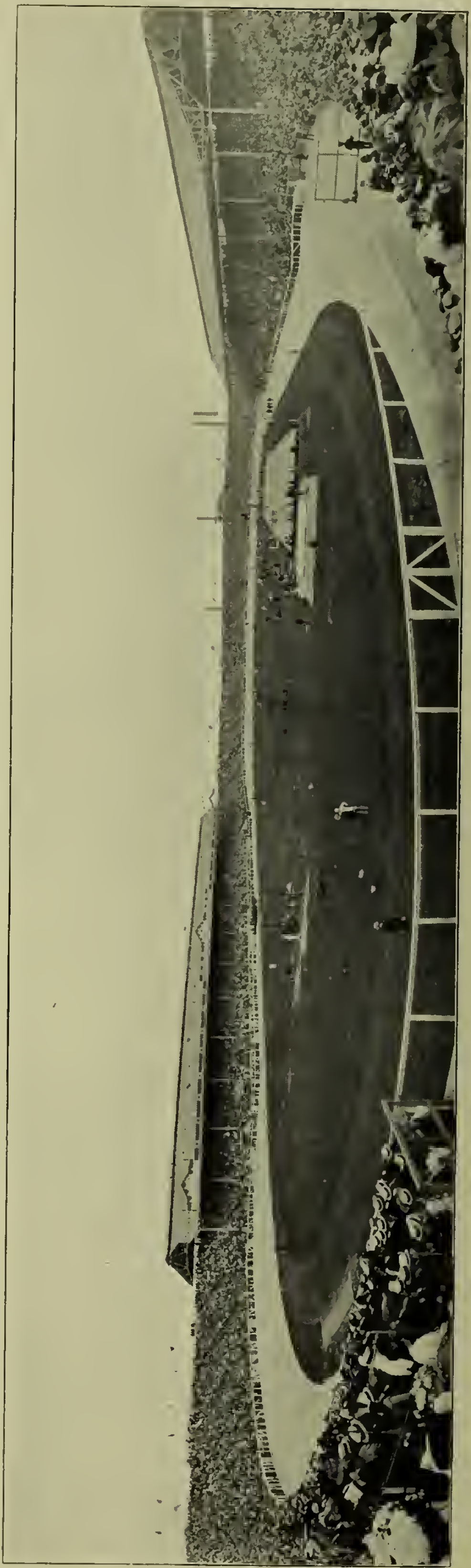
7. All suspensions by either body to be binding on the other body.

8. It shall be within the power of any club to refuse any entry to its own Sports, and it shall be competent for the A.A.A. or N.C.U. to issue recommendations to its affiliated clubs to refuse any entry.

9. If a permit be refused by either body to any privately-promoted or speculative meeting, or one that is considered objectionable, it shall be against the laws of both bodies for that meeting to be subsequently, directly or indirectly, carried out under the management of an affiliated club of either the A.A.A. or N.C.U.

10. Any club refused affiliation by the A.A.A. or N.C.U. shall be ineligible for affiliation to either body without the consent of the other.

11. That any club after having been members



A VIEW OF THE STADIUM, OLYMPIC GAMES, 1908.

of either body shall not be elected to the other body, nor granted permits for sports, until communication be made as to the cause of such club's retirement.

N.B.—Clubs affiliated to the A.A.A. and N.C.U. are not required to obtain permits from either body to hold Athletic or Cycling events, but non-affiliated clubs or meetings registered under Rule XVIII. of the A.A.A. code must obtain a similar registration from the N.C.U., for which application should be made to the Sec., N.C.U., 27 Chancery Lane, London, W.C.

Handicappers.

All Handicappers shall be licensed by the A.A.A. for Athletic events, and by the N.C.U. for Cycling events, and it shall be allowable for any person to hold a licence from both bodies.

A minimum charge of 10*s.* 6*d.* per handicap, or a total of £2 2*s.* for four handicaps, either foot or cycle, is obligatory upon all holders of joint A.A.A. and N.C.U. Handicapping Licences. This does not apply to holders of A.A.A. Handicapping Licences only.

Also in all cases of mixed meetings, a copy of the prospectus and programme must be sent to the Secretary of the A.A.A., or District Secretary, and to the Secretary of the N.C.U. Central Council.

A minimum fee of One Guinea, payable in advance, shall be charged each handicapper by the body licensing him.

Infringement of A.A.A. Laws.

Any infringement of A.A.A. Laws, or any other malpractice connected with Athletics, should immediately be notified to the Secretary or representative of the proper Local Association or to the Secretary of the A.A.A. The Amateur Athletic Association undertakes to bear the expense of all necessary prosecutions in the case of charges preferred by an affiliated club.

EXTRACTS FROM THE A.A.A. LAWS OF IMPORTANCE TO ATHLETES.

Law XIII.—"The Association strongly deprecates the selling of prizes, and the Committee is instructed to take such action as they may think necessary when such sales are brought under their notice."

Law XIX.—"That anyone who wilfully competes against one who is under sentence of suspension shall be himself suspended until the expiration of such sentence, or for such longer period as the Committee may think fit."

Law XXII.—"That anyone taking part in a competition to the winner of which a prize and money are offered as alternatives shall be suspended for such time as the Committee may think fit."

Law XXIII.—"That the General Committee, the Southern Committee of the A.A.A., and the Committee of the N.C.A.A. and M.C.A.A.A., shall have power to reinstate any amateur who shall have competed for money or against a Professional in ignorance of the Laws of the A.A.A., or shall otherwise have offended against or broken the said Laws."

"That no application for requalification to compete under A.A.A. Laws shall be considered unless accompanied by a deposit of 5*s.*, such deposit to be only returnable to the applicant at the discretion of the Committee."

Law XXVII.—(*a*) "All clubs affiliated to the A.A.A. shall have the following rule incorporated into their rules, viz.: 'That the Committee shall have power to expel any member whose subscription is six months in arrear, provided a month's notice in writing shall have been sent to such member by a registered letter, addressed to his last known address, informing him of the proposed action of the Committee."

(*b*) "The name and address of any person so expelled from a club in the Southern District shall be sent to the Hon. Secretary of the A.A.A.; and of any person so expelled from a club in the Northern or Midland Districts, to the Secretaries of the N.C.A.A. and M.C.A.A.A. respectively, and shall be entered by each of such officers in a book (to be called the 'Black Book') kept for that purpose. Every person whose name has been so entered in a Black Book shall be suspended from competing at a meeting held under A.A.A. Laws until the liability causing his said expulsion, which shall not exceed one year's subscription, shall have been discharged."

"N.B.—Club Secretaries sending up a name for entry in a Black Book must send with each name the Post Office receipt for the registered letter sent to such person, or the name will not be inserted."

Law XXIX.—"After the first year, every competitor in open races under A.A.A. Laws must be a member of an affiliated club or of a club which is a member of an affiliated Association or kindred body recognised by the A.A.A. Competitors in local, closed, or Scholars' and Veterans' event to be exempt."

Law XXXII.—"That no entry shall be made or accepted unless a form of entry authorised by the A.A.A. be used."

TIME RECORDS.

Event.	NAME. Record made by	Distance.	Date.	Club of which a Member.
		M. YDS.		
1 hour's Run	A. Shrubb	11 1,136	5 Nov., 1904	South London H.
2 hours' Run	G. Crossland	20½	22 Sept., 1894	Salford H.
1 hour's Walk	G. E. Larner	8 438	30 Sept., 1905	Brighton & County H.
3 hours' Walk	J. Butler	21 49	23 Oct., 1897	Polytechnic H.
8 ,, ...	,, ...	50 1,190	12 June, 1905	,,
9 ,, ...	H. Swabey	51 161	,,	Vegetarian C. & A.C.
10 ,, ...	,, ...	55 1,657	,,	,,
12 ,, ...	A. W. Sinclair ...	64 180	27 Aug., 1881	North Lon. A.C.
24 ,, ...	T. E. Hammond ...	131 580	—	Blackheath H. & Surrey W.C.
		H. M. S.		
London (Westminster Clock Tower) to Brighton (52¼ miles) (Walk)	T. E. Hammond ...	8 18 18	1 May, 1909	Blackheath H. & Surrey W.C.
London to Brighton and back (104½ miles)	T. E. Hammond ...	18 13 37	21 & 22 June, 1907	Surrey W.C.

Records

Passed by the General Committee to date.

RUNNING.

Distance.	NAME. Record made by	Time. H.	M.	S.	Date.	Club of which a Member.
Yards.						
*100	A. F. Duffey			9⅘	20 July, 1901	Boston, U.S.A.
120	W. P. Phillips			11⅘	25 Mar., 1882	London A.C.
	C. A. Bradley				28 April, 1894	Hudderfield.
	A. R. Downer				11 May, 1895	London A.C.
	A. F. Duffey				8 July, 1901	Boston, U.S.A.
	J. W. Morton				24 Sept., 1904	South London H.
*120 Hur.	F. C. Smithson			15	25 July, 1908	Amer. Olympic Team.
150	C. G. Wood			14⅘	21 July, 1887	Blackheath H.
	C. J. Monypenny				27 Feb., 1892	Cambridge U.A.C.
200	E. H. Pelling			19⅘	28 Sept., 1889	Ranelagh H.
	A. R. Downer				11 May, 1895	London A.C.
	G. Jordan				16 Mar., 1896	Oxford U.A.C.
220	C. G. Wood			21⅘	25 June, 1887	Blackheath H.
250	E. H Pelling			24⅘	22 Sept., 1888	Ranelagh H.
300	C. G. Wood			31⅖	21 July, 1887	Blackheath H.
300 Hur.	O. Groenings			36⅗	21 Sept., 1907	Polytechnic H.
440	H. C. L. Tindall			48½	29 June, 1889	Cambridge U.A.C.
	E. C. Bredin				22 June, 1895	London A.C.
†440 Hur.	T. M. Donovan			57⅘	13 June, 1896	Queen's College, Cork.
	J. B. Densham				7 Sept., 1907	South London H.
600	E. H. Montague		1	11	19 Sept., 1908	London A.C.
880	M. W. Sheppard		1	54	21 July, 1908	Amer. Olympic Team.
1,000	W. E. Lutyens		2	14⅘	5 July, 1898	Cambridge U.A.C.
1,320	C. Bennett		3	10⅘	22 Sept., 1900	Finchley H.
Miles.						
1	J. Binks		4	16⅘	5 July, 1902	Unity A C.
1½	A. Shrubb		6	47⅗	26 Sept., 1903	South London H.
2	,,		9	9⅗	11 June, 1904	,,
3	,,		14	17⅗	21 May, 1903	,,
4	,,		19	23⅖	13 June, 1904	,,
5	,,		24	33⅖	12 May, 1904	,,
6	,,		29	59⅖	5 Nov., 1904	,,
7	,,		35	4⅗	,,	,,
8	,,		40	16	,,	,,
9	,,		45	27⅗	,,	,,
10	,,		50	40⅗	,,	,,
11	,,		56	23⅖	,,	,,
12	S. Thomas	1	2	43	22 Oct., 1892	Ranelagh H. & L.A C.
13	F. Appleby	1	9	27⅕	21 July, 1902	Herne Hill H.
14	,,	1	14	52	,,	,,
15	,,	1	20	4⅖	,,	,,
20	G. Crossland	1	51	54	22 Sept., 1894	Salford H.
25	G. A. Dunning	2	33	44	26 Dec., 1881	Clapton Beagles.
30	J. A. Squires	3	17	36½	2 May, 1885	London A.C.
40	G. A. Dunning	4	50	12	26 Dec., 1879	Clapton Beagles.
50	J. E. Dixon	6	18	26⅕	11 April, 1885	L.A.C. & Spartans
100	No records.					

* On grass. † Race on grass, over ten 3 ft. hurdles not less than 30 yds. apart.

ODD EVENTS.

Event.	NAME. Record made by	Distance. FT.	INS.	Date.	Club of which a Member.
*High Jump	P. J. Leahy	6	4¾	6 Sept., 1898	Irish A.A A.
Pole Jump	E. T. Cooke A. C. Gilbert	12	2	24 July, 1908	American Olympic Team.
Long Jump	P. O'Connor	24	11¾	5 Aug., 1901	Irish A A.A.
Putting the Shot (16 lb.)	D. Horgan	46	5½	15 Aug., 1894	Banteer.
Throwing the Hammer (16 lb.)	J. J. Flanagan	170	4¼	14 July, 1908	American Olympic Team.

* G. W. Rowden's 6 ft. 5⅝ in., August 6th, 1890, at Hayter Camp, is not authentic.

WALKING.

Distance.	Name. Record made by	Time. H.	M.	S.	Date.	Club of which a Member.
Miles.						
1	G. E. Larner		6	26	13 July, 1904	Brighton & County H.
2	,, ...		13	$11\frac{2}{5}$	,,	,,
3	,, ...		20	$25\frac{4}{5}$	19 Aug., 1905	,,
4	,, ...		27	14	,,	,,
5	,, ...		36	$0\frac{1}{5}$	30 Sept., 1905	,,
6	,, ...		43	$26\frac{1}{5}$	,,	,,
7	,, ...		50	$50\frac{4}{5}$	,,	,,
8	,, ...		58	$18\frac{2}{5}$	,,	,,
9	,, ...	1	7	$37\frac{4}{5}$	17 July, 1908	,,
10	,, ...	1	15	$57\frac{2}{5}$	,,	,,
11	W. J. Sturgess	1	25	$53\frac{2}{5}$	3 Oct., 1896	Polytechnic H.
12	,, ...	1	34	34	23 Oct., 1897	,,
13	,, ...	1	42	$59\frac{3}{5}$	,,	,,
14	J. Butler	1	52	$18\frac{3}{5}$	,,	,,
15	,, ...	2	0	$43\frac{3}{5}$	,,	,,
16	,, ...	2	9	39	,,	,,
17	,, ...	2	18	$56\frac{2}{5}$	,,	,,
18	,, ...	2	28	52	,,	,,
19	,, ...	2	39	$3\frac{3}{5}$	,,	,,
20	*Tom Griffith	2	47	52	3 Dec., 1870	South Essex A.C.
	J. Butler	2	49	26	23 Oct., 1897	Polytechnic H.
21	,, ...	2	59	$42\frac{4}{5}$	,,	,,
22	,, ...	3	11	36	12 June, 1905	,,
23	,, ...	3	21	3	,,	,,
24	,, ...	3	30	23	,,	,,
25	,, ...	3	40	20	,,	,,
26	,, ...	3	51	2	,,	,,
27	,, ...	4	0	45	,,	,,
28	,, ...	4	10	26	,,	,,
29	,, ...	4	20	6	,,	,,
30	,, ...	4	29	52	,,	,,
31	,, ...	4	39	43	,,	,,
32	,, ...	4	49	43	,,	,,
33	,, ...	4	59	31	,,	,,
34	,, ...	5	9	34	,,	,,
35	,, ...	5	19	29	,,	,,
36	,, ...	5	31	14	,,	,,
37	,, ...	5	41	54	,,	,,
38	,, ...	5	50	52	,,	,,
39	,, ...	6	1	8	,,	,,
40	,, ...	6	11	17	,,	,,
41	,, ...	6	21	35	,,	,,
42	,, ...	6	31	55	,,	,,
43	,, ...	6	42	9	,,	,,
44	,, ...	6	52	12	,,	,,
45	,, ...	7	3	25	,,	,,
46	,, ...	7	13	12	,,	,,
47	,, ...	7	23	18	,,	,,
48	,, ...	7	33	15	,,	,,
49	,, ...	7	42	54	,,	,,
50	,, ...	7	52	27	,,	,,
56	H. Swabey...	10	0	41	,,	Vegetarian C. & A.C.
*75	A. W. Sinclair	14	10	0	27 Aug., 1881	North London A.C.
*100	,, ...	19	41	50	,,	,,

* In matches against time.

AUTOMOBILISM—Historical.—It is difficult to deal with the whole history of automobilism—a word compounded from the Greek auto (self) and the Latin mobilis (moving)—within the limits of this section, but I have endeavoured to give a general idea of its inception, progress, difficulties, development, and principal events up to the present time.

The exact date at which the history of automobilism, using that term in the sense of self-propelled road vehicles, began cannot definitely be fixed. The invention of the locomotive by Robert Stephenson in 1829 naturally led others to imitate him on the road, and throughout the years from 1825 to 1840 road vehicles propelled by steam became common enough, and had it not been for the unfortunate interference of Parliament in 1832 and 1861, probably England would have been the first in the field as regards automobilism, and certainly by this time the development of motor-cars would be even more remarkable than it is at present.

Early History.—Throughout the eighteenth century there were many inventions dealing with the means of propelling road carriages by mechanical power, especially after the principle of Watt's steam engine had become known. It appears that as far back as 1769 a patent was taken out by a man named Moore for a horseless carriage made of wood, iron, brass, or any other metal, and so much faith must the inventor have had in his scheme that it is stated that he, like many early automobilists of our own day, sold all his own and his neighbours' horses, for fear of a fall in their value. In the same year a M. Cugnot, a Frenchman, invented and placed upon the roads a steam-driven vehicle, which, mounted on three wheels, proved too unstable for the rough French roads of that time, for they had not in those days attained the reputation they now enjoy, and the vehicle eventually overturned. It is interesting to note that even in those days the military authorities realised the immense utility of mechanical propulsion for transport purposes, and the Minister of War instructed Cugnot to construct a machine capable of drawing artillery; but, unfortunately, his efforts do not seem to have met with much success.

One of the most prominent names amongst the early pioneers of mechanical locomotion is that of Trevithick, who built the first passenger-carrying locomotive for the roads in 1800. Trevithick made his first run at Camborne, in Cornwall, where he had his workshop, and he carried as his first passengers some of his workmen, the total weight amounting to 30 cwt. To show how efficient for that time was his machine, he ascended a hill of a fairly steep gradient at 4 miles per hour, while he travelled on the level at speeds up to 8 and 9 miles per hour. Three years later Trevithick was running a steam coach on the London streets, 106 years before motor-'buses were running as we know them to-day, but his experiment came to an end for want of funds. A few years later a tubular steam boiler was fitted to a coach by a mechanical engineer named James, and carried 15 persons at a speed of 10 to 12 miles an hour through the roads of Epping Forest. In this instance also lack of funds retarded James's progress, but by this time public interest in mechanical locomotion was aroused, and many are the cartoons, prophetic and otherwise, which appeared about this period, 1800-1820. At the same time, too, mechanical road locomotion received an impetus through the efforts of Sir Goldsworth Gurney, whose name will always be associated with the early encouragement of steam carriages, for though he did not, perhaps, invent any startling novelty or method of propulsion, by his untiring efforts he certainly did a great deal to popularise mechanical locomotion. About 1823 Gurney constructed a small gas propelled engine, which was satisfactorily worked by ammoniacal gas. In the early stages of his experiment we find from various old prints that Gurney tried to abandon the use of wheels, and provided his first vehicle with levers or legs with which to grip the road surface when ascending inclines. The famous coach, which made the record drive up Highgate Hill towards Edgware, was constructed in 1826, and was fitted with a special boiler planned by Gurney himself to produce about 12 horse-power. From the various illustrations of this coach, it may be noticed that the gripping legs have later on been replaced by the more practical wheels. Two years later Gurney built an improved coach which ran long distances on the road. One journey is on record of 10 hours' duration, when over 84 miles were covered, and 1831 saw a public service of steam coaches built on Gurney's principles running between Cheltenham and

RICHARD TREVITHICK.
The pioneer of the motor-car movement.

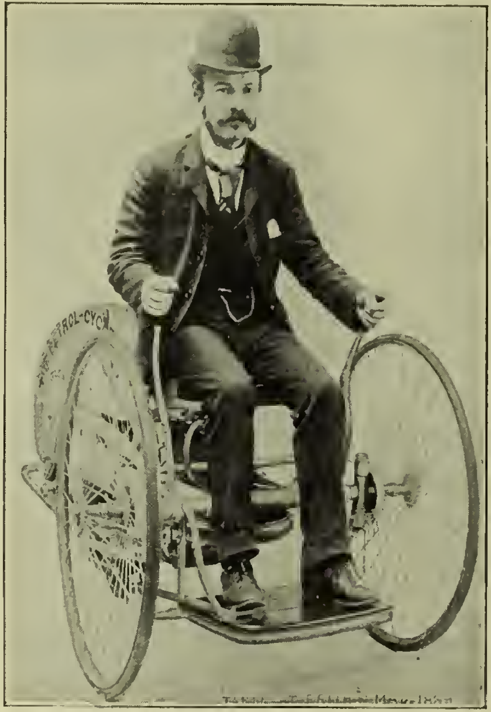
Gloucester, a distance of 9 miles. In view of the obstructive legislation which came later on, it is interesting to note that in 1831, before a Committee of the House of Commons, it was stated with a directness and truth which is equally appreciated to-day, "Obstacles are always thrown in the way of a new invention, particularly if it is likely to produce important results, by those who expect their interests will be affected by its success." In the particular case under consideration the horse-dealers and the horse-breeding interests were terrified that they would lose their livelihood if these mechanically propelled vehicles came into general use, and eventually they won the day. This same Committee which sat to investigate the opposition to steam coaches advised Parliament, nevertheless, to repeal the old Turnpike Act, and a Bill entitled the Steam Carriages Bill was passed through the House of Commons, but eventually thrown out by the Lords, who were particularly identified with the horse-loving community at that time. The Commons also recommended that a grant should be made to Gurney for his past services, but the Chancellor of the Exchequer refused to pay this grant, thus proving no exception to the general rule that the State is always very unwilling to recognise merit or to reward it. As regards the taxes in vogue during Gurney's experimental running, a charge of £2 8*s.* was made as toll charges on the steam carriage on the Liverpool route, while a loaded horse-drawn coach paid only 4*s.* for a similar distance.

Another name connected with steam carriage construction is that of Walter Hancock, who at one time seemed likely to achieve considerable success. Owing to Hancock's efforts several services of public steam carriages were placed on the London roads, and vehicles carrying 22 passengers apiece ran regularly for some time. Had Hancock's business capabilities been on a par with his engineering knowledge, these vehicles would no doubt have proved a paying concern, and led to the encouragement of further mechanical traction. Hancock's public service steam carriages, and also the Gurney coaches, ran intermittently till about 1840, when they seem to have been gradually withdrawn, probably because they did not pay sufficiently well. Many interesting prints and cartoons are still in existence which illustrate these ponderous-looking steam coaches which were placed on the roads.

The dawn of the railway era, which began about 1840, transferred public interest and inventive genius to railed locomotion, and although several isolated cases of road locomotion are recorded, no further advance was made at the time. In 1861 Parliament discussed and passed a Bill which still further retarded any progress being made in mechanical locomotion, and four years later—1865—the so-called "Red Flag Act" was passed, requiring an attendant to precede each road engine bearing a red flag, while the speed was reduced to a maximum of four miles an hour. This deliberate and intentional attempt to prevent the monopoly of the horse being interfered with killed for the time being any further efforts to popularise self-propelled traffic.

Thus, though England had been in the forefront as regards mechanical traction and inventions dealing with this subject in the earlier and middle part of the nineteenth century, it was left to the Continent, and more particularly to France, to follow her lead after our short-sighted legislation had damped down all ardour for progress in this country. In 1875 M. Amédée Bollée, an engineer connected with the engineering and iron works of the Dietrich Co. at Luneville, ran a steam carriage on the road between Paris and Le Mans, a distance of 230 kilos. Various experiments continued to be made by Continental engineers from this year onwards, and, naturally enough, slow but distinct progress was made year by year. With the rise of Gottlieb Daimler, however, really began the present automobile movement. Gottlieb Daimler was born at Schorndorf, in the province of Wurtemberg, in 1835. He was first employed at a gun factory in Alsace, and at an early age developed his fondness for mechanics. Subsequently, he came to England, and was employed at some steam locomotive works at Manchester, where he studied engineering. On his return to Germany he assisted Dr. Otto, the engineer, in the construction of the gas engine which bears his name, and whose inventive genius is recognised by the mechanical term, "Otto Cycle." In 1872 Herr Langen, a German Privy Councillor, financed Dr. Otto and Herr Daimler, and started them in engineering works at Dentz. In 1882 Daimler left the partnership and devoted himself to experiments at Cannstatt, and to the invention of a high-speed gas-engine. The first motor produced in 1883 was of a horizontal, not a vertical, type, as later on, and is described in the patents as follows: "The ignition is produced by a red-hot tube, which is found at the end of the compression chamber. The motor continues to work even after the tube is allowed to cool on account of the high temperature of the cylinder walls."

It was while making his secret experiments with the motor engine that Herr Daimler was suspected by his neighbours of being a counterfeit coiner, and he narrowly escaped trouble at the hands of the ignorant but inquisitive police. Two years later, in 1885, the first light internal combustion motor engine was produced, and Herr Daimler now began to turn his attention to its appliance to road vehicles, and had one fitted to a tricycle. At about the same time Herr Karl Benz, of Mannheim, in Germany, and a Mr. E. Butler, in England, also produced a somewhat similar type of engine, and at an exhibition held at Earl's Court in London in 1885 Daimler and Benz showed their internal combustion engines. Butler, being an Englishman, did not meet with the same measure of encouragement or success as did his foreign contemporaries, for the English authorities characteristically refused him permission to run his motor-fitted tricycle on the road even experimentally. In 1886 Daimler fitted one of his motors, on which he had made various improvements, and which now had an arrangement for throwing the propelling machinery in and out of gear, to a four-wheeled wagonette, which may be looked upon as the first motor-car as distinct from motor tricycles.



1889. Edward Butler on his Motor Tricycle.

Taken at Erith, May, 1889. Six months after, all further development of this little "petrol" motor was abandoned. The first made in this country. Working drawings shown at "Inventions Exhibition," London, 1885, with description.

In 1887 M. Sazarin, a Frenchman, acquired the Daimler patents for France, and began to make experiments with the motor, and manufacture at the workshops of MM. Perrin, Panhard & Cie. It was here that M. Emile Levassor was employed, and on the death of Sazarin he married his widow and gained with his wife the right to use in France the famous Daimler patents. Karl Benz, in the same year (1888), brought out a two-seated three-wheeled carriage, which travelled at a speed of 15 miles per hour, and which, in common with his earlier efforts, had a horizontal cylinder fitted with a water-jacket. In the same year Leon Serpollet, in France, put on the road both a steam tricycle and a small four-seated steam car. Steam tricycles produced by the Marquis De Dion, a leading French enthusiast, whose subsequent success in producing good but cheap small motor-cars is well known, and by MM. Bouton and Trepardoux, were also seen in 1888. It was also in this year that John Dunlop patented his pneumatic tyre, which, though fitted to bicycles in the first place, was soon taken up by the early French pioneers for their motor vehicles. The first French Daimler engine was produced at the Panhard works in 1889, and in the same year Gottlieb Daimler patented his two-cylinder V-type engine; this engine was afterwards fitted to a boat and exhibited at the Paris Exhibition in 1889. Two of the early motor engines made at the Panhard works were delivered to MM. Peugeot, who subsequently became connected with the industry themselves. Serpollet in the following year (1889) produced his first flash boiler, and now began a period of useful experiments on the part of many of the leading French pioneers and makers. MM. Panhard, Levassor, Bouton, Peugeot, Bollée, De Dion, and Serpollet were all tireless in their efforts to produce a satisfactory engine for mechanical propulsion on the road. Two years later Panhard completed his first petrol car, and M. Peugeot, on a vehicle fitted with a French Daimler engine, ran from Paris to Brest without any serious mechanical trouble.

In England, Edward Butler had been working at, and had improved, his petrol engine. He completed his motor tricycle, which attracted some attention amongst engineers, in 1892. Next year (1893) Maybach invented the float feed carburetter, which was soon extensively adopted by the early manufacturers. It was in 1894 that the founder of the French paper *Le Petit*

Journal, M. Pierre Giffard, began to organise trials and tests with a view to encourage the French manufacturers, and also to promote public interest in the new invention. The first road race took place in July, 1894, and was run from Paris to Rouen, a distance of nearly 80 miles. Twenty-six vehicles participated in this run, the start being watched by huge crowds at the "Rond Point." The following list will be interesting, as showing the competing cars which finished the first road race of its kind, together with the times taken on the route:—

De Dion (steam)	5 hrs.	40 mins.
Peugeot (petrol)	5 ,,	45 ,,
,, ,,	5 ,,	50 ,,
Panhard & Levassor (petrol)	6 ,,	3 ,,
Peugeot (petrol)	6 ,,	7 ,,
Le Brun ,,	6 ,,	24 ,,
Panhard & Levassor (petrol)	6 ,,	30 ,,
De Bourmont (petrol)	7 ,,	1 ,,
Peugeot (petrol)	7 ,,	2 ,,
Vacheron (gasoline)	7 ,,	3 ,,
Peugeot ,,	7 ,,	5 ,,
Panhard & Levassor (petrol)	7 ,,	10 ,,
Roger (petrol)	8 ,,	9 ,,
Le Blanc (steam)	8 ,,	50 ,,

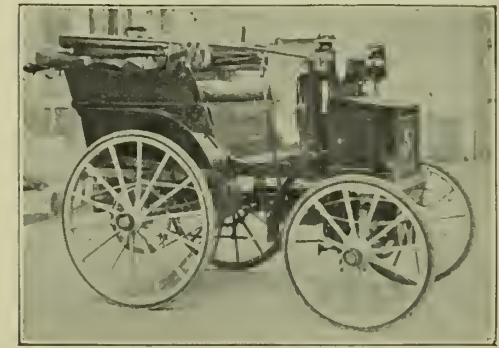
The winners thus averaged just over 14 miles an hour.

The first prize, 5,000 francs, which was presented by *Le Petit Journal*, was divided between Panhard & Levassor and the Peugeot Brothers. The second prize was secured by the Marquis de Dion, who had now entered the trade as De Dion, Bouton & Cie. An electric car had also been entered for this road contest by the Comte Carle, but was detained by the Customs authorities for eight days for investigation, and consequently was unable to run. The French pioneers, after this successful run, decided in November to hold a meeting to discuss further tests, and at this meeting, which might be called the first congress on automobilism, were present many Frenchmen whose names have now become famous in the motor world: The Baron de Zuylen, the Marquis de Dion, the Marquis de Chasseloup Laubat, MM. Ganthier, Ravenez, Peugeot Frères, Levassor, Dufayel, Serpollet, Lavalette, Roger, Recoupe, Menier, Giffard, de Place, Meillan, Nansouty, and Moreau. At the meeting was organised a big race for the following year, a subscription list was started, and 100,000 francs (£4,000) was subscribed. The route chosen was from Paris to Bordeaux, 723 miles, a severe test in those early days. After the Paris-Rouen race the manufacturers started to construct quite a number of vehicles; one firm, that of Panhard & Levassor (the two early pioneers had now joined forces) built 90 vehicles, and constructed 350 motors for various purposes.

In England in the same year (1894) Mr. John Henry Knight built his first motor vehicle in July, and Mr. H. Hewetson, in August, ordered a Benz car, which was delivered in the following November. In the latter part of the year Mr. J. A. Koosen brought the first Lutzmann car to England. It was in the following year that Mr. Hewetson began to drive his small Benz car through the London streets, and was eventually cautioned by the police authorities not to repeat the offence, whereupon he naturally removed the car to Ireland, where the police had plenty of other and more important matters to attend to. The Hon. Evelyn Ellis brought the first Daimler car into England in June, 1895. The same month also saw the Paris-Bordeaux race on the Continent, which did a great deal to stimulate public interest in the new method of locomotion. The winning car was a 4-h.p. Panhard, which carried two passengers, and completed the distance (732 miles) in 48 hrs. 47 mins. It was in 1895 that Mr. Shaw Lefevre (now Lord Eversley), who was then President of the Local Government Board, brought forward the Light Locomotives Act in England, but this was not carried through, owing to a General Election and change of Government. Sir David Salomons, another English enthusiast, and one who has done much for the development of automobilism, organised in October an exhibition of motor vehicles at Tunbridge Wells in connection with the Agricultural Show at that town.

The first Petrol Motor Car introduced into England (fitted with Electric Ignition). Driven by Mr. Henry Hewetson in 1894.

The exhibits consisted of Sir David Salomons's own car, a 3¼-h.p. Peugeot, fitted with a French Daimler engine; the Hon. Evelyn Ellis's Panhard carriage, Daimler type; a De Dion steam tractor attached to a landau; and a De Dion Bouton motor tricycle with a petrol engine and electric ignition, which invention was a great advance on the tube ignition, till then universally adopted. Following on this exhibition Sir David Salomons suggested the formation of a body to deal with the subject of mechanical locomotion, and a few months after was formed the Self-Propelled Traffic Association, which had its home in Liverpool.



1895. 4-h.p. Phœnix. Winner of Paris-Bordeaux Race.

France had already a paper, *La Locomotion Automobile*, devoted to the interests of mechanical locomotion, and November saw the publication of England's first journal dealing with the subject, *The Autocar*. The Automobile Club of France was established in the latter part of the year, while in England various petitions were placed before the Government of the day to remove the existing ridiculous restrictions on the use of mechanical vehicles.

1896 was an eventful year all round for automobilism, and was a landmark in its progress here. Great strides were made in France, the newly-formed Automobile Club gaining many distinguished and enthusiastic members, while in England in January the *Engineer* and *The Autocar* organised a petition to Parliament to allow light locomotives (as motor vehicles were then called) to run on the roads. In February, through the instrumentality of Sir David Salomons, a deputation waited on the Local Government Board, and in March, Lord Harris, on behalf of that deputation, brought before the House of Lords a measure, called the Light Locomotives Bill, which passed its second reading in April. In June Mr. Henry Chaplin, the President of the Local Government Board, and a member of the Cabinet, moved and carried the second reading in the House of Commons. Mr. Frederick Simms, in the earlier part of the year, formed the Motor Car Club, and arranged for a demonstration in the summer at the Imperial Institute, which was attended by many M.P.'s and members of the House of Lords. Amongst the exhibits were seen the following: The Hon. Evelyn Ellis's Panhard car; a Benz car; Orrord &. Son's electric carriage; Mr. Walter Bersey's electric phaeton; Messrs. New & Mayne's petrol cycle; Messrs. Humber's motor cycle fitted with a Kane-Pennington petrol motor; a Serpollet steam carriage; a De Dion tricycle and bicycle; while M. Leon Bollee also brought over his petroleum-actuated tricycle, and the newly formed British Daimler Co. showed a Peugeot 'bus, two Victorias, a Peugeot *vis-à-vis*, and several 4-h.p. motors.

Even before Parliament had finally sanctioned the Light Locomotives Act, and while the matter was still under discussion, automobilism, which had received so many legislative drawbacks in its already short life, encountered a great disaster. Highly imaginative prospectuses were placed before the public at this stage, and in the first flush of enthusiasm some two or three million pounds were put up by the unsuspecting investors and lost. The scandal attending the promotion of the Horseless Carriage Co. especially was a severe set-back to the infant days of the movement, and made the obtaining of capital very difficult for motor-car purposes for some years afterwards.

1896. Early 6-h.p. Daimler Car.

The Light Locomotives Act (1896) meanwhile passed through Parliament and came into force on November 14th, on which day a demonstration was organised to celebrate the emancipation of the horseless vehicle. This demonstration took the form of a run from London to Brighton. No attempt at fast running was made, and huge crowds lined the route to Brighton to witness this memorable sight. Herr Gottlieb Daimler was present on this occasion, and most of the men of note in the then small world of automobilism took part in the proceedings. Lord Winchilsea, in a banquet which followed the journey, implored the public not to be too hasty in forming a judgment as to the capabilities of the mechanically driven vehicles, but to wait awhile and see to what purpose it would serve them.

1896. 3¾-H.P. PEUGEOT, DRIVEN BY THE HON. C. S. ROLLS ON ENGLISH ROADS BEFORE THE REPEAL OF THE "RED FLAG ACT."

The Light Locomotives Act, though its conditions appear childish to the automobilists of to-day, was the first charter of liberty and freed motorists from the "red flag man." The maximum speed allowed was 14 miles an hour, with power to the Local Government Board to reduce it. Taking advantage of this provision, the maximum was fixed at 12 miles an hour, a figure which remained till January 1st, 1904. The chief features of the Act which was passed on August 14th, 1896, may be summed up as follows: Permission for light locomotives—that is, vehicles propelled by mechanical propulsion—to use the roads of this country at a restricted speed. The regulations as to lights, warning bells, wheels, &c., were left to the Local Government Board to frame. The weight of any vehicle was fixed by the Act not to exceed four tons unladen.

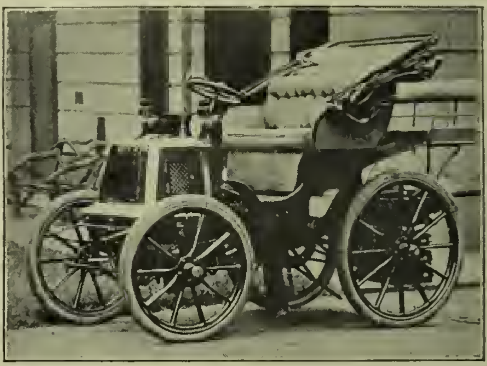
In September the Paris-Marseilles Race aroused much enthusiasm in France. This was the first race run in stages, official timekeepers or umpires of the Automobile Club of France being carried on competing vehicles. The race began from Versailles, and 32 vehicles started, 24 being driven by petroleum spirit, 3 by steam, while 5 were motor-tricycles. M. Bollee, on a motor-tricycle, covered the first day's stage at an average speed of 20 miles an hour, the best performance which had been recorded by a mechanically-propelled vehicle up to that date. The number of cars which travelled to Marseilles and back to Paris again was surprising, considering the distance, the rough state of many of the roads for vehicles so badly sprung, and the short time which had been given to the study of the petrol engine. The result of this run was as follows:—

PARIS TO MARSEILLES—1,073 MILES.

Panhard & Levassor (M. Mayard)	67 hrs.	42 mins.
,, ,, (De Knyff)	68 ,,	11 ,,
De Dion tricycle	71 ,,	1 ,,
Panhard & Levassor (Levassor) ...	71 ,,	23 ,,
De Dion tricycle	73 ,,	30 ,,
Peugeot car	75 ,,	26 ,,
Delahaye	75 ,,	29 ,,
Peugeot	81 ,,	23 ,,
De Dion tricycle	83 ,,	6 ,,
Delahaye	84 ,,	27 ,,
Maison Parisienne	100 ,,	41 ,,
,, ,, ...	108 ,,	39 ,,
Laudry & Beyroux	137 ,,	11 ,,

The winning Panhard car was afterwards purchased by the Hon. C. S. Rolls, the second son of Lord Llangattock, one of England's young pioneers; and the second vehicle was taken over by Mr. S. F. Edge and subsequently fitted with the first Napier engine.

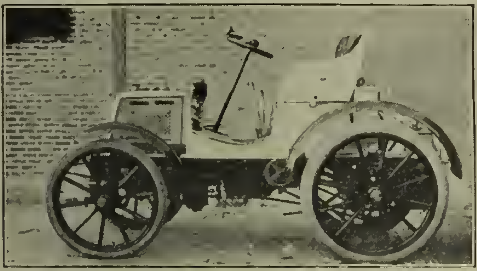
1897.—The feature of the following year was the formation of the Automobile Club of Great Britain and Ireland as a society for the encouragement and defence of automobilists. Though given the title of "Club," it is not with its social aspect that we shall deal, nor has this, indeed, at any time been an important feature, but rather we shall try to point out the way this body has defended the interests and encouraged the development of the movement as a whole. France some two years before had given England the lead by organising a similar body for the encouragement of mechanically-propelled vehicles across the Channel, and it was natural, therefore, that in August, 1897, Mr. Simms, who had already done much pioneer service, proposed the idea of a club on a larger scale than that of the already existing Motor Car Club, and was assisted in his idea by the Hon. Evelyn Ellis and Mr. C. Harrington Moore. Mr. Roger Wallace, K.C., whose authority on patent and engineering matters was well known, was invited to act as first chairman of the body, and in December Mr. Claud Johnson was selected as secretary. To those indefatigable workers in the early days we owe the sowing of the seed of development which is destined to affect all mankind and the fate of nations. It will not be out of place, and, indeed, it is only just, to mention the names of some of those gentlemen who came forward with financial assistance at a time when those who believed in the future of automobilism were derided by public opinion as enthusiasts and dreamers. Mr. F. R. Simms placed a sum of £800 at the disposal of the Club, followed by the following gentlemen, who guaranteed a sufficient fund to start the Club: Messrs. Roger Wallace, K.C.; Hon. Evelyn Ellis; Sir David Salomons (who had been actively instrumental in organising the Self-Propelled Traffic Association, which was afterwards incorporated in the Club); Messrs. H. E. Sherwin Holt, Frank H. Butler, Walter Bersey, Worby Beaumont, Sir Boverton Redwood, Messrs. Alex Siemens, S. F. Edge, John W. Parr, James McManus, Henry P. Holt, Wm. J. Leonard, E. L. England, Henry Sturmey, C. Harrington Moore, T. W. Staplee Firth. H. Hewetson, J. J. Vickers, Stanley Spooner, Sir Hiram Maxim, and some 18 or 19 others. Premises were taken at 4 Whitehall Court, premises which in these days would hardly hold the Club's working staff, to say nothing of its members, which at the end of this year, 1897, numbered 163. Mr. Simms subsequently increased his loan to £1,000, and the membership began to grow with the beginning of the following year, among those who joined being the Hon. J. Scott Montagu (now Lord Montagu), who formed the first Parliamentary Party a few years later. In June, 1899, the Club organised a show of motor vehicles in the Deer Park at Richmond, attracting a great deal of public interest, and gaining further converts; and a guarantee fund, in order to assist the Club to hold the exhibition, received a grant of £100, contributed by Mr. Alfred Harmsworth, now Lord Northcliffe, the proprietor of the *Daily Mail* and many other periodicals. When the original guarantee fund expired in the following year (1900), the original guarantors again renewed their responsibilities. Sir David Salomons, Lord Northcliffe, Mr. Charles Cordingley, Mr. Paris Singer, and Mr. Mark Mayhew came to the assistance of the Club by providing working capital, and Mr. Simms was repaid his original loan.



1897. 6-H.P. PANHARD. FIRST OF THE TYPE FITTED WITH WHEEL-STEERING.

To proceed with the history of the movement, we will deal with the events of 1898 and 1899. It will interest motorists to-day to know that in the August of 1897 Mr. Cordingley, in his Laundry Exhibition at the Agricultural Hall, included a display of motor vehicles, and this "side" show consisted of 12 vehicles. Compared with the recent Olympia shows of 1907 and 1908, it is, indeed, wonderful to observe what gigantic strides have been made from the time when motor vehicles formed an insignificant annexe to an exhibition for laundry appliances to the modern crowded shows which receive wide-world attention, and were visited in 1908 and 1909 by 112,324 and 115,000 people respectively.

1898 saw the racing tendency accentuated in France. The Paris-Amsterdam Race took place in July, in which event wheel-steering and a four-cylinder balance engine were first used on the Panhard cars, while M. Charon, on an 8-h.p. Panhard car, covered the 938 miles in 33 hrs. 4 mins., an average speed of about 28½ miles an hour, a very fast speed considering the low horse-power used. In the Bordeaux-Paris Race, which followed, the Chevalier René de Knyff drove a 6-h.p. Panhard to victory, accomplishing the 351 miles in 15 hrs. 15 mins., an average of over 23 miles an hour.



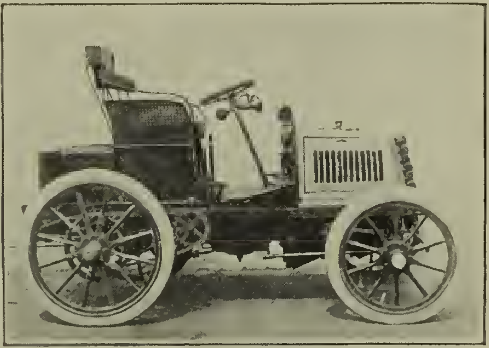
1898. 8-H.P. IN PARIS-AMSTERDAM RACE.

In England a Heavy Vehicle Trial was held at Liverpool, which interested many commercial firms, who began to see the benefit they would derive from the new form of locomotion. It was in 1898 also that the late King, then Prince of Wales, gave evidence of his interest in the development of the motor-car by being a passenger in a 6-h.p. Daimler, driven by Mr. Critchley, the then manager of the Daimler works.

1899.—In 1899 there came into being many new types of cars, and several engineers and former cycle enthusiasts now began to turn their attention to the motor vehicle. The Automobile Club of Great Britain and Ireland was steadily increasing in membership, and taking an active part both in the development of the industry and in the organisation of motorists for mutual defence. In addition to the Richmond Show, an exhibition was organised at Dover, and in the latter part of the year the Club took over the control and management of all motor competitions and races.

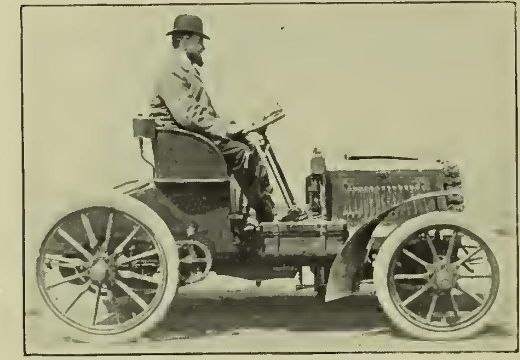
Two Continental events in this year did much to bring before the public of more than one country the possibilities of a practical future for mechanical locomotion. These two events were the Tour de France and the Paris-Ostend Race. The former contest was organised by the French journal *Le Matin*, and the route traversed was some 1,380 miles in length, extending over a period of seven days. The Panhard cars entered for this trying test came through satisfactorily, the 16-h.p. of that make doing remarkably well. The Chevalier René de Knyff, on a 16-h.p. Panhard, covered the total distance in 44 hrs. 42 mins., an average of about 31 miles an hour. In the same month Mr. James Gordon Bennett offered the Gordon Bennett Cup, a trophy for which many exciting contests took place in later years. The Paris-Ostend Race over a course of 201 miles witnessed the advent of many new makes of cars. M. Levegh, on a 16-h.p. Mors, and M. Giradot, on a 12-h.p. Panhard, tied in 6 hrs. 11 mins., a speed of about 33 miles an hour, while in the tourist section of this contest English competitors took the second and third prizes, the Hon. C. S. Rolls, on a Panhard, taking second place, and the Hon. J. Scott Montagu (Lord Montagu) winning the third place on a 12-h.p. Coventry-built Daimler, the first English-built car to race abroad, notwithstanding that, owing to a fractured water-pipe, he started 2½ hours behind the first two prize-winners.

It was probably in this year and the following (1900) that France made the greater part of her headway in the motor world, for while a few enthusiasts and engineers were working in England, the legal restriction of 12 miles an hour and the general lack of official and public encouragement held back all but a few venturesome spirits, and thus France was given a start which took Great Britain 6 or 7 years to recover. May, 1900, will be remembered by all the early pioneers, and will in future doubtless be mentioned by all the writers on automobilism as the "Year of the Thousand Miles Trial." Now, when the



1899. 12-H.P. CAR. WINNER OF THE TOUR DE FRANCE.

advance and development of the movement has become so certain as to be a commonplace, we motorists are apt to forget what an important part the Thousand Miles Trial played in laying the future foundations and forming the history of automobilism. This trial, which was to result in such a beneficial issue, was conceived chiefly as an educational factor for the public benefit, and originated entirely from the brain of the capable and able secretary of the Club at that time, Mr. Claud Johnson. It was cordially supported by the whole Club committee, who at that time were enthusiasts and practical men, and who realised themselves and wished the public also to realise, the importance to the country of helping a new engineering industry. It was also necessary to demonstrate that motor vehicles were neither toys nor freak vehicles, but a form of locomotion which was going to be intensely practical and utilitarian in character. When it is remembered that this trial was the first that had ever been originated on our roads, and that the public anticipated a crop of dreadful accidents, that the police and local bodies such as road authorities hated the very name of motor-car, that vehicles and owners alike were not even trusted for hotel bills in many places, that the Press in most instances poured ridicule fair and unfair on the scheme; then it will be realised, with perhaps some astonishment, what a stupendous undertaking was the organisation of such a trial. Mr. Claud Johnson, for the Thousand Miles Trial, if for nothing else, will always deserve the gratitude of motorists, past, present, and future. The following itinerary was spread over 18 days' travelling, including exhibition days at the chief towns, and in order to place on record the ground covered by this educational journey we give the dates and places:—



1900. 20-H.P. PANHARD.

1900.		miles.
April 23rd.	London to Bristol	118½
,, 24th.	Exhibition at Bristol.	
,, 25th.	Bristol to Birmingham ... ... (*viâ* Cheltenham.)	92½
,, 26th.	Exhibition at Birmingham.	
,, 27th.	Birmingham to Manchester	110
,, 28th.	Exhibition at Manchester.	
,, 3 th.	Manchester to Kendal	73¼
May 1st.	Kendal to Carlisle	61½
,, 2nd.	Carlisle to Edinburgh	100
,, 3rd.	Exhibition at Edinburgh	
,, 4th.	Edinburgh to Newcastle	121½
,, 5th	Exhibition at Newcastle.	
,, 7th.	Newcastle to Leeds	103
,, 8th.	Exhibition at Leeds.	
,, 9th.	Leeds to Sheffield	74
,, 10th.	Exhibition at Sheffield.	
,, 11th.	Sheffield to Nottingham ... ... (This day's programme included a speed contest on the Duke of Portland's estate at Welbeck.)	82½
,, 12th.	Nottingham to London	123½

Sixty-five vehicles started out on the first morning from Whitehall, and only seventeen failed to complete the whole trial, a wonderful result at such an early stage in the automobile development. The performance of competing vehicles was such that the Press and public began seriously to consider the new form of locomotion, and a great amount of public attention was attracted, and thus the object of the Club Committee was gained. Those motor vehicles which achieved the long journey with credit to themselves and their drivers were discussed and made the subject of inquiry by many would-be buyers.

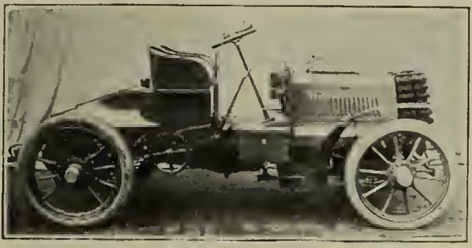
In the following month of June the first Gordon Bennett Race was run in France. The route lay from Paris to Lyons, 353¾ miles. France, Belgium, and America pitted their cars against each other, the two latter countries being represented by one car only. The winner, M. Charron, covered the course at an average speed of 38.45 miles per hour. The two other French competitors were Giradot and the Chevalier

1900. THE FIRST 12-H.P. PANHARD RUN IN ENGLAND—THE FIRST CAR FITTED WITH TUBE AND ELECTRIC IGNITION.

René de Knyff. Jenatzy represented Belgium, and Mr. Winton, on a Winton car, drove for America, but gave up the race at Chevreuse owing to a broken wheel. In connection with the 1900 Paris Exhibition, a three days' race was held from Paris to Toulouse, and it was even more remarkable to note the excellent performance of the smaller cars of the voiturette type, and one, a 4-h.p. Renault, is recorded as having covered the Paris-Toulouse course at an average speed of 22 miles an hour. It should be mentioned that the death of Herr Gottlieb Daimler took place in 1900, but not before he had seen the immense future already opening out for mechanical vehicles to whose efficiency he had contributed so large a share.

Towards the latter part of 1900 the Automobile Club began to consider the means whereby it could best keep up the education of the authorities, and also meet the growing opposition from the public to the new form of locomotion, an opposition which was largely the result of ill-founded prejudice. In the early part of 1901 the Club, therefore, started by endeavouring to educate the County Councils. Further legal restrictions seemed likely in the immediate future, and many County Councils had passed resolutions asking the Local Government Board to limit the speed of motor-cars to 10 miles or less per hour. Chairmen and clerks of County Councils, and chief constables of counties were invited to attend a conference which was held in February, and later on, in June, 1900, a demonstration was convened which was attended by hundreds of county councillors, and motor-car runs were organised for their benefit all over the country. To realise the result of this stupendous and carefully thought out campaign and its attendant results, one has only to look back and note that the County Councils Association, the central body representing Local Government, passed a resolution to the effect that, provided cars carried in future identification plates and their drivers were licensed, it would ask for no specified speed-limit. In this case the County Councils Association proved much wiser than the House of Parliament in 1903.

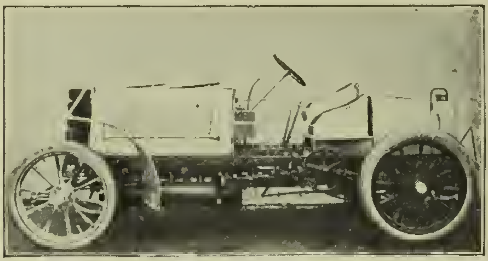
The big Continental race of 1901 took place over a course from Paris to Berlin, and contest was encouraged both by the French and the German Governments. The winner, M. Fournier, on a 60-h.p. Mors, averaged 46½ miles an hour. Comparing this record with previous times, each succeeding contest brought forward cars of bigger horse-power of more reliable character and more perfect pattern; 110 competitors started in the big 1901 race, which was instrumental in bringing together the various enthusiasts of the different countries, nearly every big European country being represented. The second Gordon Bennett Race in 1901 was won by M. Giradot, who drove a 40-h.p. Panhard car at an average speed of 38 miles per hour. France was represented by Levegh on a 60-h.p. Mors (a monster in those days). M. Charron (Panhard), S. F. Edge was the only English competitor, but could not participate in the actual race, as, by the conditions of the race, every part of the car must be made in the country it represented, and Edge's car was, unfortunately, fitted with French tyres.



1901. 40-H.P. PANHARD.

In England the Automobile Club had now become a large and powerful body, and many provincial clubs were rapidly being formed, among the chief of them being the Scottish and Irish Automobile Clubs, the national clubs of their respective countries. The Automobile Club itself found its quarters too small, and removed to a new clubhouse at 119 Piccadilly, thus marking its entry into social clubland.

1902 was a remarkable year for contests, both at home and abroad, and also for the growth of automobilism generally. Hundreds of country gentlemen and well-to-do people began to realise the utility of the motor vehicle, and to press it into daily service. Motor manufacturers, especially those on the Continent, commenced to vie with each other to build big and luxuriously fitted cars and attain high speeds. At the Nice speed contest, Serpollet, on his steam-propelled machine, achieved a speed of 70 miles an hour over a flying kilometre, a record which was again exceeded in August by Mr. Charles Jarrott, who, on a private road at Welbeck, drove a 70-h.p. Panhard at 79¼ miles per hour, only to be beaten again by Gabriel later in the month with a 60-h.p. Mors over a flying kilometre at 84.6 miles per hour. There is no doubt that these racing vehicles and their trials did much to improve the construction of the ordinary touring car, though at the time the speed attained made a bad impression on the public generally, for only too many people in England, ill-natured and jealous of the progress being made as falsifying their prophecies of failure, were apt to class all mechanical vehicles as racing monsters, horrible and dangerous. The Gordon Bennett Race of 1902 was a memorable one from England's point of view, for it was won for the first and last time by an Englishman, Mr. S. F. Edge, who wrested the coveted trophy from France for this country. The race was over the road from Paris to Innsbruck. In the contest the French cars met with many reverses; Henri Fournier made very fast running, but had to abandon the race at Belfort after the first day's stage owing to a broken shaft and bent frame.



1902. 60-H.P. PANHARD.

Numerous competitions and trials were also organised by the Automobile Club during the year, among the most important being the 650 miles Reliability Trial with 92 entrants, and the 4,000 miles Tyre Trial. Motor-boating also began to come to the fore in this year, and a body called the Marine Motor Association was formed in November to act as the ruling body in all marine competitions and sports. The industry meanwhile organised its particular guardian body in the form of the Society of Motor Manufacturers and Traders, which was legally incorporated in the summer of 1902. This Society was the first really representative commercial body formed, though the Automobile Commercial Protection Association had been founded a year or two previously with the special object of preventing the undue extension of patent rights which at one time threatened the industry with considerable though unenforceable penalties for the use of devices in which there were no patentable qualities.

1903 was a very important year for the motor-car movement, for it was the year in which the first Act to regulate motor-cars and motor-car traffic was brought in, superseding the experimental Light Locomotives Act of 1896. Remembering the unfortunate part which various Houses of Commons and Governments had played in former years in regard to mechanical traction, those members of the House who were in touch with the new industry were naturally apprehensive lest any attempt should be made to interfere with the progress of automobilism. They knew that very little unwise legislation would throw this country back into the state produced by the restrictions of 1833, and would, therefore, handicap England in relation to other countries, who were less hampered, and in which a more liberal spirit prevailed. A committee of Parliamentary motorists had been formed in 1902 under the leadership of the Hon. John Scott Montagu, M.P. (Lord Montagu), the Hon. Arthur Stanley, M.P., Mr. (now Sir) Henry Norman, M.P., and others, who, irrespective of party, determined to uphold the cause of automobilism, and who on this occasion had many preliminary meetings in order to decide as to amendments in the Act where they seemed necessary. The Bill as originally introduced by the Government in the House of Lords may have been said to have been on the whole an excellent one, and was certainly far ahead of the legislation which had preceded it. To begin with, the Bill, as first introduced into the Upper House in July, after an interesting debate, was passed practically unaltered. It included the numbering of cars, the licensing of drivers, and gave power to the Local Government Board the power to make regulations. Lord Balfour of Burleigh, the representative of the Local Government Board in the House of Lords, defended the absence of a speed-limit on the ground that speed in itself was not necessarily dangerous, but only speed in the wrong place and at the wrong time, and it was pointed out both by him and other

PEUGEOT CAR DRIVEN BY GOUX.

speakers that Section I. of the Act, which enjoined upon the motorist the necessity of driving with due regard to the traffic which might be expected on the highway, and threw the responsibility of driving to the common danger on the motorist at whatever speed he was proceeding, was a far better safeguard for the public than a rigid speed-limit, which would be illogical and difficult to enforce. In this form—that is, without a speed-limit, but with numbering and licensing—the Bill passed the House of Lords and went to the House of Commons. Here the attitude of the Legislature became changed. Members, both Unionist and Liberal, sitting for agricultural constituencies, feared opposition from their constituents, while horse-breeders and other allied trades were becoming acutely aware that this new form of locomotion boded them no good, and would probably lead to the gradual cessation of the use of horses for traffic purposes and the substitution of mechanical means of traction. In due course the Government became aware of this feeling, and Mr. Walter Long, the President of the Local Government Board, who would have liked, no doubt, to have carried the Bill as it stood, had to bow before the storm, as the Government Whips told him that they could not count on securing a majority for the Bill as it stood. Eventually it was settled by the Government that some speed-limit should be inserted. When the Parliamentary Automobile Committee heard this, they took steps to resist it by every means in their power, but, as they only numbered 57, and as the Liberal Party as a whole were prepared to vote with the Government, giving the latter an assured majority, it was obvious that the insertion of a definite speed-limit was unavoidable. Seeing that defeat on this point was inevitable, they endeavoured to get as high a speed as possible inserted. On the other hand, the anti-motorist party stipulated for not more than 15 miles an hour as a maximum speed. Eventually the Government were able to induce a sufficient number of their followers to accept 20, and 20 miles an hour was fixed as the maximum speed, after an amendment suggesting 25 miles an hour had been moved by Mr. Montagu and defeated. As a concession, however, the Bill was made to expire in three years in order that, if necessary, this portion of the Act might be reconsidered. But various other amendments were proposed by the Parliamentary automobilists and carried. It should be put on record that the 57 members of the Automobile Committee made a fight which was probably unprecedented in the case of a measure of this kind, for its strenuousness and the length at which the Bill was debated. The House met on Friday at noon to consider the Bill in Committee, and the debate was carried on throughout the whole of that day and night up to between 5 and 6 o'clock on the Saturday morning, a period of 18 hours' continuous sitting, during which the leading motorist champions were hardly absent from their seats for one moment. It is largely to their efforts on this occasion that the subsequent rapid progress of motoring in this country was due, for, had the Government not realised the determination of this gallant band of 57, most of whom were practical automobilists, they would have taken the easier course and given way still more to the anti-motorists, who were at that time in a large majority on both sides in the House of Commons. The proceedings of Parliament are not always easy to understand, and the general public is curiously ignorant of the details of procedure in such cases. There was some little outcry, therefore, afterwards against those who specially represented automobilism in Parliament, on the ground that they had accepted too easily the speed-limit of 20 miles an hour, and some critics averred that it would have been better to have lost the Bill altogether than to have accepted it in its modulated form. But those who argued thus did not understand first of all that the Bill was a Government one, and by no amount of insistence could the Parliamentary motorists have secured its withdrawal, and, secondly, that when 57 votes are opposed to 300, the minority have to accept, whether they like it or not, the decisions which the division lobbies confirm. This feeling was very strong in some places, and some leading motorists outside the House of Commons and some of the motoring press, ill-informed as to the real state of affairs, declared that not only had the Parliamentary motorists betrayed their trust, but that automobilism was irrevocably ruined—this was stated in the Automobile Club Journal of the day—and that there was no future now for this young and growing industry. The absurdity of these criticisms need hardly be commented on in the year 1910. The fact was that the Parliamentary leaders of the movement saw that half a loaf was better than no bread, and that the half loaf was inevitable, and realised that the 20 miles an hour was far better than the 12 miles an hour which existed under the 1896 Act, though the penalties for contravening certain regulations were too heavy, and that, as every passing year would augment the number of motorists and their influence on every kind of public body, including Parliament. Time was on their side. To have destroyed the Bill, even had it been possible, would have been folly. In fact, in view of the Government's attitude on the question, they undoubtedly took the right course. Looking back on the years which have elapsed since 1903, it can honestly be said that the Motor Car Act of 1903 has worked very fairly well, with the single exception of the "police trapping" system, which was, of course, not contemplated when the Act was passed, and which is more a matter of administration or mal-administration than of legislation. The prejudice with which the law has been administered in some districts and the bias which has been shown by anti-motorist magistrates, notably in the counties of Surrey and Sussex, have tended to disgust not only motorists, but an increasing number of moderate-minded men, and the vindictive character of the proceedings in many cases has been little short of a public scandal. The power of appeal in the case of all fines over £1, however, is now being somewhat more freely used, and Quarter Session and the Higher Courts are constantly reversing the decisions of prejudiced benches. It will be some time, however, before motorists can hope to receive really judicial treatment uninfluenced by the dislike which so many magistrates openly avow for motor-cars and motorists in general. It should also be recalled that one of the chief objections raised by some motorists to the Act of 1903 was that for the first time it enforced the use of numbers on cars for the purpose of identification and the taking out of a driving licence by each individual motorist. It was said at the time that no one would care to label their cars in this way, and that the bearing of a number savoured strongly of the treatment of a convict. It was also urged with more reason that if motorists were numbered, other vehicles should be numbered also, for instances of drivers having caused an accident and subsequently driving away, leaving the injured unhelped, were just as numerous amongst those in charge of horses as amongst motorists. Whatever force this argument may have had at the time, it is certain that the decision to accept identification by numbers, though much criticised at the time, was one of the wisest actions of the Parliamentary Party. Those who did not wish to run away had nothing to fear from numbering, whilst those who were disposed to escape or had committed any offence against the law were easy to trace. In practice it has been proved over and over again that by means of these numbers motor-car drivers who have driven to the danger of the public have been identified greatly to the advantage of the rest of the automobile community who use their cars sensibly and considerately. Not only this, but a good deal of public prejudice was at once allayed, for it was more and more recognised that it was in the best interests to suppress the road-hog and to secure the due punishment of reckless offenders.

From this year (1903) and onwards, partly owing to the debate of the House of Commons having given the subject prominence, and partly owing to the increasing number of motor-cars, numerous letters appeared in the newspapers protesting against the speed at which the new vehicles were driven, and declaring that 12, or at the outside 15, miles an hour was fast enough. All kinds of irrational abuse were showered on motorists, and some newspapers, which have since adopted a totally different tone, led a hot campaign against the small and struggling community, probably not exceeding 10,000 to 15,000 in all, who were trying to convert their fellow-countrymen and the country in general to mechanical locomotion, to make them see how useful this new kind of transport was going to be, and what a pity it was to throw so many difficulties in the way of its development. This Press campaign, which lasted more or less for two or three years, usually took the form of reporting every single motor-car accident or trouble, however trivial, and magnifying it and imparting all possible prejudice into it. In many cases accidents solely concerning horse carriages and tram-cars were headed "motor accidents," and such was the virulent antipathy displayed that the Automobile Club had on more than one occasion to expose the deliberate falsity of such news, and to show either how exaggerated, or how unfounded were the charges brought against motorists in many cases. In fact, one may say that till 1905 or 1906 the whole atmosphere surrounding the journalistic treatment of the motor-car was that of unjust prejudice. There may have been some reason for this tendency, which can only be hinted at, but at any rate it is significant that, with the great increase in advertising derived from the motor-car industry, the prejudice gradually vanished, and a much more fair tone became observable.

Though the Motor Car Act was the feature of the year in regard to the history of the movement, the racing events of 1903 were also important in many ways. The

Nice Race Meeting of 1903 saw most of the fast racing cars then built, and the chief motorists of the day gathered together. The unfortunate death of Count Zborowski when running his racing Mercédès on the La Turbie Hill naturally cast a gloom over the whole meeting. The Paris-Madrid Race, organised by the French Club, resulted in a series of disasters and the death of two well-known motorists and one other competitor. The race had promised to be an exciting contest, no less than 216 competing cars starting from Versailles for Bordeaux, a distance of 324 miles, from whence they were to run over the frontier to the Spanish capital. M. Louis Renault was the first to reach Bordeaux, Jarrott, the English driver, came in second, while Gabriel, on a Mors car, took third place, though he made the best time, covering the distance in 313½ mins. Marcel Renault, brother of the first arrival at Bordeaux, met his death at the corner of a road near Poitiers. Several injuries also were reported to spectators; it was, of course, impossible to protect the whole of this route, and the roads were not kept clear. The authorities abandoned the race after Bordeaux, and the cars in racing and tourist classes proceeded to Madrid under ordinary conditions. The following is a record of the principal times made while the race lasted from Paris to Bordeaux (324 miles) :—

HILL TRIALS.

	hours	mins.	secs.	an average of
Gabriel (Mors) ...	5	13	13	66 m.p.h.
Sulleron (Mors) ...	5	46	1	
Jarrott (De Dietrich)	5	51	55	
Warden (Mercédès)	5	56	30	
De Crawtez	6	1	8	
Voigt (G C.V. ...	6	1	9	
Gasteaux (Mercédès)	6	8	0	

Louis Renault (Renault) made fast time in the light car section, covering the course in 5 hrs. 33 mins. 59 secs.

For some time after this most unfortunate race it was feared that the English authorities would forbid the running of the Gordon Bennett Race in Ireland, but, knowing that the race would take place under very different circumstances from those of the big French race, the Automobile Club pressed for its fulfilment, and the race took place as arranged on July 2nd, a special Bill having been piloted through the Commons by Mr. Scott Montagu to sanction the race on British roads. The English Eliminating Trials were held in April, at Welbeck, on the Duke of Portland's estate. The following is a list of the teams :—

England—
S. F. Edge (winner of the 1902 Gordon Bennett) [(Napier).
C. Jarrott (Napier).
Stocks ,,

France—
Chevalier R. de Knyff (Panhard).
H. Jarman ,,
Gabriel ,,
America—
Percy Owen (Winton).
Mooers ,,
Winton ,,
Germany—
Jenatzy (Mercédès).
De Caters ,,
Foxhall Keene ,,

Right from the start, the American team encountered misfortune, for Winton's car refused to start when the signal was given.

The enthusiasm of the Irish, always a sporting people, in connection with this race was remarkable. The nature of the course was such as to make careful driving at times both necessary and desirable. The French team drove admirably, and to them fell the team prize of a silver trophy, presented by the "Car" illustrated. Jarrott, unfortunately, met with an accident while rounding a corner, the car overturning and injuring both the driver and mechanic. In connection with this incident occurred an act of courtesy on the part of Baron de Caters, a Belgian, but one of the German team, who not only stopped when passing Jarrott to see if he could be of assistance, but stopped again in the middle of his running to give the news at the Grand Stand that Jarrott was not seriously hurt. At this junction the contest was "anybody's race," and Baron de Caters's sportsmanlike action in jeopardising his chance will not be forgotten by the motor world.

The following is a table of the first five who finished the course, and is a striking testimony of the regular running of the cars on the circuit:—

	1ST.	2ND.	3RD.	4TH.	5TH.	6TH.	7TH.	TOTAL.
	M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	H M S	H. M. S.
Jenatzy ...	48 58	1 1 19	49 43	1 1 52	53 16	1 1 32	1 2 16	6 39 0
De Knyff ...	49 47	1 2 31	50 57	1 8 16	51 40	1 3 30	1 3 50	6 50 40
Jarman ...	47 41	1 10 27	49 35	1 5 55	50 31	1 2 7	1 5 28	6 51 44
Gabriel ...	53 10	1 0 19	1 2 37	1 4 20	51 4	1 13 52	1 6 5	7 11 33
Edge... ...	46 23	1 7 3	1 27 59	1 24 49	1 14 35	1 55 21	1 22 21	9 13 48

It will thus be seen that Edge's first round was the fastest; the winner's average worked out at 49.25 miles per hour.

The Circuit des Ardennes was run on June 22nd. Happily, this French contest shared a better fate than its larger predecessor. To obviate the nuisance of dust, which had proved so troublesome in the Paris-Madrid Race, the course, a stretch of 50 miles, was oiled. The course was covered six times, and the best performances were as follows:—

	hours	mins.	secs.
Baron de Crawher (Panhard) ...	5	52	7
Giradot (G.C.V.)	6	12	11
De Bron (De Dietrich)	6	24	29
Le Blon (Serpollet)	6	31	3

The Brescia Circuit in September may be said to have been the commencement of the Italian automobile racing, and quite fittingly was won by a car of Italian manufacture, a Fiat, piloted by Lancia.

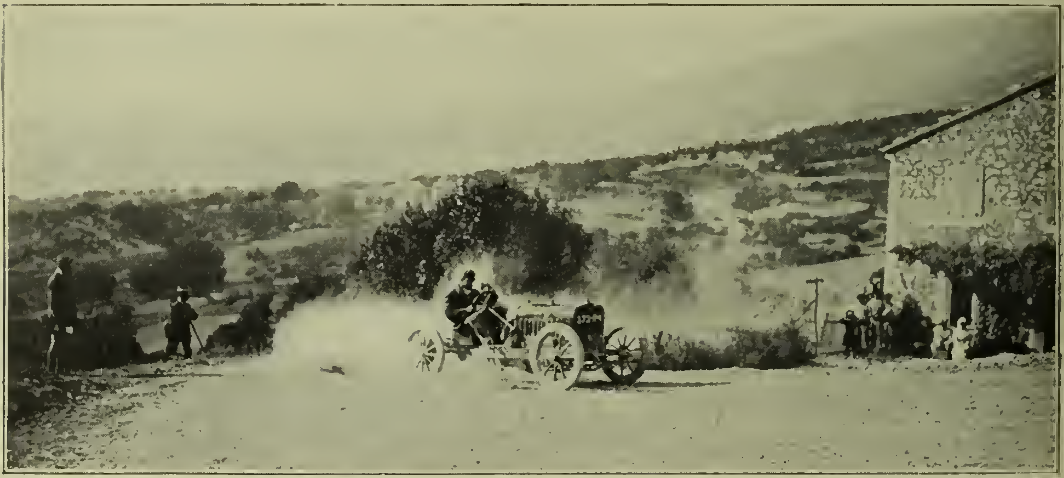
1904.—As regards sport in 1904, the year opened with a race meeting on the Ormond Daytona Beach at Florida, U.S.A., in January. A large fleet of cars collected together for this meet, and some thousands of American motorists who had enthusiastically taken up the new sport witnessed the races on this admirable beach track. Mr. W. K. Vanderbilt on this occasion achieved a speed of 92 miles an hour on his 90-h.p. Mercédès car. It had been suggested by many motorists when the idea was first formulated of using this beach track that the sand would seriously damage the tyres, but on examination at this and subsequent meetings it was found that the hard wet sand was not injurious, and that even at the end of some of the fifty-mile races the tyres were remarkably cool. In the Riviera spring meeting, which began towards the end of March, the chief interest, as had been the case in later years, was centred in the marine motors, but some very fine performances were made by the racing cars. Quite a cosmopolitan gathering of cars, makers, and their owners were now seen at the principal race meetings, and Nice was now recognised as a record-breaking track. It was on the Riviera that the first record of 100 miles an hour was made by a French car, and later on also a speed of 120 kilometres an hour was attained by M. Serpollet on his Serpollet steam car. At the 1904 meeting both records were beaten by the French motorist, Rigolly, on a 110-h.p. Gobron-Brillee car, for he accomplished a speed of 152 kilos. 540 metres an hour, or 94¾ miles an hour. Napier and Mercédès cars also made good times. The race on La Turbie Hill for the De Caters' Cup was won by Duray, also steering a Gobron Brillee car, who covered 500 metres in 26 secs. Speed trials at Ostend Nieuport took place in May, many of the leading Continental racing motorists taking part. Baron de Caters on this occasion covered a flying kilometre in 23 secs.—98 miles an hour—on his 90-h.p. Mercédès car.

The Ladies' Automobile Club was formed in June, 1904, and speedily became a great success. During that summer and in subsequent years many meets and gymkhanas were organised by the L.A.C., which has now a membership roll of nearly 500.

In consequence of Jenatzy's victory in Ireland in 1903, the fifth Gordon Bennett race (1904) took place in Germany. The English Eliminating Trial, from which the three British competitors were chosen, was run over the Isle of Man course in May. Eleven cars started on this trial, five Napiers, three Darracqs, and three Wolseleys, for the much-coveted honour of representing England in the big international race. The competitors were all well-known men in the racing motor world, being Messrs. S. F. Edge (Napier), winner of the Gordon Bennett Cup of 1902; J. W. Stocks (Napier), W. Edmond (Darracq), John Hargreaves (Napier), M. Henery (Darracq), Clifford Earp (Napier), Campbell Muir (Wolseley), Sidney Girling (Wolseley), A. Rawlinson (Darracq), Charles Jarrott (Wolseley), and Lt.-Col. Mark Mayhew (Napier). The circuit of the course was 51 miles 1 furlong in length, and had to be traversed six times; 580 constables guarded the course, which the Automobile Club had taken great pains to render safe and dustless. Six cars finished the first day's test of eight hours' running, and on the following days over a three-round test on the circuit seven cars turned up—the three Darracqs not putting in an appearance, the Napier driven by Lt.-Col. Mayhew was also an absentee. Earp, on his Napier, rounded in the second course in 43 mins.; this driver, unfortunately, at the end of the speed tests on the third day, met with an accident which badly damaged the car and put him out of the running altogether. The following team was chosen at the end of the trials to represent England in the cup race: S. F. Edge (Napier), Sidney Girling (Wolseley), and C. Jarrott (Wolseley). The last-named had also undertaken to drive a De Dietrich car in the French Eliminating Trials. The French Eliminating Trials were held over the Circuit de l'Argonne, the Automobile Club of France organising these trials in a splendid way, laying the whole circuit with westrumite to keep down the dust; the French Government also told off 3,000 soldiers to guard the course. Previously the A.C.F. had selected representatives without competing tests, but there were too many important and powerful cars in the French field to make an arbitrary selection successful. Twenty-nine competitors started, amongst them the cream of the Continental racing motorists: Gabriel, Baras, Hanriot, Baron de Crawhez, L. Théry, Le Blon, Salleron, Farman, Rigolly, Rogier, Jarrott, Beconnais, Guders, Fournier, Caillois, Chauliand, Leger, Teste, Duray, De la Touloubre, Baron de Forest, Wagner, Clément, Amblard, Stead, Pelser, Levergue, Tart, and Burton. The French test was finely organised and fairly run. A notable incident occurred in connection with this race, which speaks well for the French manufacturer and his ability to cope with disaster. The weighing-in of the competing vehicles took place on Thursday; on the preceding Tuesday a Georges Richard car, driven by Caillois, had been badly burnt, the back wheels entirely destroyed. This car was removed to the works at Ivry, a gang of

PARKWAY MOTOR RACE, U.S.A.

workmen turned on to it, and at 4 o'clock on the Thursday the car weighed in with the others for the race—a veritable record for repairs. Rigolly, on his Gobron Brillee car, was prime favourite, but the race resulted in a surprise, for the very high-powered cars were weeded out, apparently not being strong enough for long-distance travelling. The sixth and last round of the circuit found the cars in the following places: Thery, on a Georges Richard; Salleron, on a Mors; and Rougier, on a Turcat; Gabriel (De Dietrich), Le Blon (Serpollet), Caillois (Georges Richard). The first three were therefore the representatives of France for the Gordon Bennett Cup Race, Théry averaging 61.7 miles an hour over the whole course. Germany had abandoned holding any Eliminating Trials, and the selection was made by the German Automobile Club; two Mercédès and an Opel Darracq were selected. American cars suffered much bad luck, and finally were withdrawn from participating in the race. Italy and Austria sent their full complement of entries, while Switzerland had one representative, Dufaux, on an 80-h.p. Dufaux car. The complete teams were as follows:—



LA COURSE DU MONT VENTOUX. BERNY ON A HISPANO-SUIZA CAR.

England.—S. F. Edge (Napier), S. Girling (Wolseley), C. Jarrott (Wolseley).
France.—L. Théry (Richard Brassier), Salleron (Mors), Rougier (Turcat Méry).
Germany.—Jenatzy (Mercédès), De Caters (Mercédès), Opel (Opel Darracq).
Belgium.—Angiers, De Crawhez, Hautvast (all Pipe cars).
Austria —Warden, Braun, Werner (all Mercédès cars).
Italy.—Cagno, Lancia, Storero (all Fiat cars).

The Swiss car met with an accident at the preliminary weighing-in, and was excluded from running. The race itself was held on a course over the Taunus Mountains—over four circuits measuring in all 343½ miles. "A grand race, strenuously run," was the general verdict of the 1904 Gordon Bennett Cup Race. Tremendous crowds witnessed the memorable race, representatives of every nationality being present. The Kaiser himself witnessed the race, and took a deep interest in the fortunes of the various cars. Amidst great excitement the French driver, Théry, on a Richard Brassier car, came in the victor, and thus France regained the trophy. The consistent running of the winner's car was one of the remarkable features of the race, a feature which he afterwards maintained in other contests, and which won for him the name of "clockwork Théry." The winning car completed the course in 5 hrs. 50 mins., Jenatzy, the second, in 6 hrs. 1 min. 28 secs.

Later in the year at Arras some good records were made by the French drivers Beconnais and Barras on Darracq cars, who covered a standing mile in 1 min. ⅕ sec., while Hanriot, on a Bayard car, covered a flying kilometre in 28 seconds. The American racers, though they had not shown up to any great advantage in the trials for the Gordon Bennett representation, continued to hold various track races during the summer. In June, at Readville, near Boston, Mr. Vanderbilt's Mercédès, driven by Sartorri, won the 10 mile open race in 10 mins. 8 secs. An American on a Durbin steam car covered the five mile course of another race in 5 mins. 3 secs.

July 14th saw the opening of the Ostend Race Meeting for this year over the well-laid roads at Ostend and Snaeskerke. Baron de Caters, on his 90-h.p. Mercédès, covered a distance of 5 kilometres in 2 mins. 52⅝ secs., a speed of well over 100 kilometres an hour. Several big and well-known cars took part in the 10-kilometre race, which Rigolly covered in 4 mins. 43 secs. In the mile race previous records rapidly fell, and it was calculated that several of the cars ran the last portion of the mile at a speed of over 160 kilometres an hour, while in the flying kilometre all previous records were wiped out by the feat of Rigolly on his Gobron-Brillie, who covered this distance in 21⅗ secs., at a speed of 103½ miles an hour, the first record of over 100 miles per hour. Barras, his rival competitor, was not far behind this time, as he covered the same distance in 22 secs.

been laid. Some high-powered cars were in evidence at this particular meeting, among them being two 100-h.p. Darracqs belonging to Mr. A. Guinness and Mr. Rawlinson, Mr. Clifford Earp's 100-h.p. Napier, and the Hon. C. S. Rolls's 100-h.p. Mors. Mr. Earp was successful in doing the kilometre run in 26⅖ secs., a speed equivalent to 84.68 miles an hour, exactly the same speed as that which Mr. Rolls had attained on the Welbeck track earlier in the year.

In France, throughout the summer, race meetings and hill-climbing contests became very popular.

Early in 1904 much dissatisfaction was expressed amongst automobilists generally, and amongst its members in particular, against several actions of the Automobile Club. The annual motor show organised by the S.M.M. & T. was generally accepted as the official show for the industry, and it was felt by the trade that a multiplicity of shows was mistaken policy. Despite the fact that the majority of manufacturers had undertaken to exhibit at the S.M.M. & T. show, then held at the Crystal Palace, but in subsequent years at Olympia, the club granted its patronage to Mr. Cordingly's show for the sum of £500. In other ways also a tendency to trade and to compete with legitimate business in the motoring world was manifested; there was much dissatisfaction with the Automobile Club Journal, and also with the censure they had passed on the Parliamentary Committee after the passing of the Motor Car Act by the House of Commons, followed by injudicious letters which had been circulated to County Councils, an action which alienated numerous M.P.'s and local authorities throughout the country. The prestige and

La Course du Mont Ventoux. Lancia Car driven by Tangazi.

Belgium held its 1904 contest over the Ardennes Circuit, which measured 373 miles. The victory fell to a French Panhard car, steered by Heath, an American driver, who had made many unsuccessful attempts in various contests. The failures through tyre troubles were particularly notable in this race, which was run continuously without controls, many competitors losing all chance through this cause. On all sides it was universally admitted that improvement in tyre construction was necessary. Heath accomplished the 373 miles in 6 hrs. 30 mins. 49 secs.

Various minor meetings were organised in England by the Automobile Club; a very successful gathering took place on the track at Bexhill in August. Mr. A. L. Guinness succeeded in covering a kilometre at a speed of 58 m.p.h. on his 60-h.p. Mercédès. Among some other good sporting events which were held at English summer resorts was the meeting at Blackpool in October, where a splendid track had the future of the Club were at stake, and it was felt that the Club Committee needed reforming, and that it was necessary that a fresh policy should be undertaken. The controversy affected not only the Club and its members, but the whole of the industry. Both the motoring Press and the daily Press took up the matter strongly, and before the annual general meeting of the Club, various prominent members were hard at work endeavouring to instil new blood and much-needed reform into the parent body of automobilism. A reform party, organised by Lord Montagu, published a manifesto putting forth the fact that the Club had acted in several cases in such a way as to cause difficulties which resulted in the resignation of many leading motorists. The manifesto pleaded for the election of a new committee, and suggested sundry reforms. This reform committee sent out proxies for the ballot of its proposed new committee a week before the general meeting concurrently with the old committee's appeal for re-election. The annual meeting held on March 10th saw a record attendance of members at the Institution of Mechanical Engineers, and the complete victory of the reform party. Out of the fifty names which had been put forward by the reform party, forty-nine were elected. Mr. Roger Wallace, who had accomplished excellent work as the first chairman of the Automobile Club thereupon resigned his position, and Colonel Holden, R.E., was elected to take his place. Mr. Julian W. Orde, who succeeded Mr. Claude Johnson as secretary of the Club in 1903, continued in that capacity.

Track racing in America furnished some exciting contests in September, the Pope Toledo, an American-built car, gaining a victory in a five-mile contest, covering the track, a by no means easy one, in 7 mins. 2 secs. The Ford car, also American, made a good showing for itself against the so often victorious Mercédès cars. At the end of October some speed matches were held on the Empire City track at New York, when Barney Oldfield, an expert American track racer, ran against Théry, the French driver; Sartori, who drove Mr. Vanderbilt's Fiat; and Bernin, on a New Renault car. In the first heat Théry raced against Sartori on a ten-mile course, the Italian driver winning, covering the distance in 9 mins. 45⅗ secs. The American defeated Bernin in the second heat, his time being 9 mins. 44⅘ secs., in the final defeating Sartori by a run in 9 mins. 12⅗ secs., somewhat to the surprise of the Continental racers.

The American race for the Vanderbilt Cup was the last important event of the year. The victory went to France, who took the bulk of the laurels for 1904, the Gordon Bennett Cup, the Ardennes Circuit, and here again in America carried off the trophy, though an American driver (Heath) steered the winning Panhard to victory. The malicious action of certain farmers in the district of Long Island, where the race was run, somewhat spoilt the speed of the cars by their action in placing broken glass and nails on the track. France entered six cars for the competition, America five, Germany five, and Italy two.

Various inventors, many of them of a not very practical turn of mind, began in 1904 to build cars which, though they aroused a good deal of excitement and some Press notoriety, did not do much in actual running. In the early part of the year M. Bellamy, of whom little had been heard previously, constructed an 8-cylinder car of 165 h.p. The car was geared to attain a speed of 115 miles an hour, and the engine consumed, according to report, 50 litres of petrol an hour. No particular or startling record was ever achieved by this powerful car. The Buffum car, 8 cylinders, 100 h.p., turned out in the United States in the spring, was never heard to make a good account of itself. Messrs. Dobelli, of Rome, placed on exhibition in this country at the premises of Messrs. C. Friswell, in Albany Street, London, a car fitted with a tremendous engine reputed to develop 180 h.p. This freak car had four cylinders, the dimensions being 8½ bore by 18½ stroke; a specially large Longuemare carburetter was fitted on account of the large petrol consumption.

India had now begun to take more than a passing interest in the new form of locomotion; many of the native rajahs had been quick to recognise the advantages and capabilities of the new form of locomotion, and many luxurious cars were finding a ready sale in the East. An organised body of motorists had been formed at Bombay, entitled the "Motor Union of North-Western India," and this body organised and carried out a very successful series of trials from Delhi to Bombay, a distance of 880 miles. India possesses some very fine roads in certain parts of the country. These trials were open to cars of all types and sizes, a considerable number of British cars competing. Thirty-two cars lined up at the start. The running lasted for eight days, some portions of the route trying the cars very severely. The first prize, termed the Gaikwar's Cup (1,000 rupees), for the most reliable car, was won by Mr. C. Sorel's

De Dietrich; the second prize was secured by a Speedwell car for economy in running, and a third, for the best condition, by a De Dion.

At the end of January, 1905, Italy, which had hitherto not possessed an official representative body, formed its Automobile Club, with headquarters at Turin.

1905.—Track racing on the Florida Beach, U.S.A., in January, opened the racing of the year. This meeting was carried out on a big scale; the course was of 20 miles. Frank Croker, an American racing man on a big Simplex car, in trying to avoid a motor-cyclist who crossed his path, unfortunately met with a fatal accident. A Napier car, driven by Macdonald, made a good score in the mile record, covering the distance in 34 secs., or at the rate of 105.8 miles an hour. A large and powerful Mercédès, developing 120 h.p. traversed this track mile in 32⅕ secs. at the stupendous speed of 109½ miles an hour. The 100 miles race for the Vanderbilt Cup was won by a 90-h.p. De Dietrich, steered by Fletcher, who covered the distance in 78 mins. 24 secs., the average speed working out at 76½ miles an hour. This record was not officially recorded, as the machine was over the racing limit weight. Macdonald afterwards covered the flying kilometre in 23 secs.

W. K. Vanderbilt on his Mercédès Car.

Motor-cars were for the first time permitted to cross over the Simplon Pass, the order forbidding their passage being withdrawn in the spring of this year (1905).

In the early part of the year the Automobile Club of France held a meeting to discuss the conditions of the Gordon Bennett Race. For some time a feeling had been manifested that the appointment of three cars for each nation was not equitable. A country with many manufacturers, such as France, was severely handicapped in comparison with, say, Switzerland, in which there were few manufacturers; France would be put to huge expense by reason of the necessary eliminating trials, which in countries where the industry was less developed would not be necessary. The French club decided at this meeting that the race should be held this year, but that after 1905 France would not compete unless the rules were altered. It was suggested also, in order to give the French constructors a further opportunity of racing their cars, that at the same time as the Gordon Bennett Race was being run, a race should be held for an International Grand Prix, to be awarded by the Automobile Club of France. The effort to turn the Gordon Bennett Race, which was looked upon as a sporting event, into a more or less manufacturers' test, was resented by the other countries, the British Press and leading motorists being anxious to retain the international sporting character of this big event. The A.C.F. later on proposed that an Eliminating Trial should be held from which the three best cars representing France in the Gordon Bennett Race would be selected, and twelve further cars to qualify for the Grand Prix. Six cars were allotted to represent England's team, six German, three Austrian, three American, three Belgian, three Italian, and three Swiss. The English Automobile Club strongly protested against the holding of another race concurrently with the Gordon Bennett test, and the German Club also announced their intention that they did not approve of the two races being held at the same time; the Swiss, Italian, and Belgian Clubs also emphatically protested against the proposal. Much correspondence between the Clubs and the A.C.F. ensued, and columns appeared in the Press, notably in the French papers. Eventually it was agreed to call an international conference on the matter, and on February 20th a meeting of the representatives was held in Paris, at which the A.C.F. gave way, largely owing to the firm stand made by the secretary of the A.C.G.B.I., Mr. Julian Orde. At this meeting it was resolved that the Gordon Bennett Race should be run alone under the existing rules; that the proposed Grand Prix should be held 15 days later; that the Clubs taking part in the Gordon Bennett contest should support the expenses; and that the rules governing the Gordon Bennett Race should be revised for following years, and a proportionate representation given to each country, according to the extent of its motoring industry. It was afterwards suggested that the Grand Prix should be run in such a way as to form the Eliminating Test for the French cars for the Gordon Bennett Race. Finally, owing to the attitude of the French manufacturers, the Gordon Bennett Race was abandoned. The Auvergne Circuit was decided upon as the scene for the contest, a course running over the beautiful Puy-de-Dome country, and representing by no means easy travelling. For the Eliminating Trials of the French cars there were 24 entries, 3 Panhard, 3 Richard Brasier, 3 Bayard, 3 Darracq, 3 Renault, 3 De Dietrich, 3 Hotchkiss, 1 Gobron, 1 C.G.V., and 1 Automoto. The race for the selection of the French cars was an exciting one; great preparations were made by the A.C.F. on the course. The course of 84 miles was covered four times to the finish of the race. The first lap was finished by Théry on his Richard Brasier car in 102 mins. 52 secs.; on the second he did not lose a minute compared with the first round; on the third lap he met with tyre troubles, and did not finish under 1 hr. 53 mins. In this lap Sizsz, on a Renault, and Caillois (Richard Brasier) gained on Théry. Duray, on a De Dietrich, had been up to this running second to Théry. At this juncture the race was by no means a foregone conclusion, and when, on the fourth round, Thery again lost time owing to tyre troubles, great excitement prevailed as the other cars crept up; but eventually Théry came in victor; Duray, who had been running him closely, being only 9 mins. behind in gross total time. The first three cars were: (Théry) Richard Brasier, (Caillois) Richard Brasier, and (Duray) De Dietrich.

The first five cars were also chosen by the same test to represent France in the Vanderbilt Race: 2 Richard Brasier (Théry and Caillois), De Dietrich (Duray), Darracq (Wagner), Renault (Sizsz), with 2 reserve Panhard (Heath), and another Darracq, steered by Hemery. The Germans again did not hold an eliminative race for their team, selecting the cars as before.

The selection of the British team again took place at the Isle of Man course. The competitors were as follows: Cecil Edge, Clifford Earp, A. Macdonald, J. Hargreaves, all on Napier cars; Wolseley car (Bianchi), Sideley car (S. Girling), Star (F. Goodman), Darracq (A. Guinness), Wolseley (Hon. C. S. Rolls). The course is by no means an ideal one, but it is the only place that can be obtained by the Automobile Club for the purpose of such contests in the British Isles. Macdonald, on a Napier car, who was looked upon as a likely winner, met with an accident in the second round which put the car out of running. Guinness, on a Darracq, broke a connecting-rod after the first round; and Girling, on a Siddeley, also met with misfortune. Thus three cars were eliminated on the first round. The results were as follows: Napier (Clifford Earp), Wolseley (Hon. C. S. Rolls), Wolseley (Bianchi), with the two other Napier cars driven by Cecil Edge (cousin of Mr. S. F. Edge) and Mr. J. Hargreaves. The American drivers took their cars over to the Auvergne Circuit for practice work, the team consisting of two Pope Toledo cars of 50 h.p., driven by Messrs. H. P. Lytle and C. H. Dingley, and a 120-h.p. Locomobile, driven by Tracy. Switzerland and Belgium withdrew from the race, so that 18 competitors started, three Mercédès cars representing Germany, steered by Jenatzy, De Caters, and Werner respectively; the same well-known type of car representing Austria, while Italy put on the field three Fiat cars, handled by the formidable team in the shape of the since well-known racers, Lancia, Cagno, and Nazzaro. The race itself took place in July; the Auvergne course, by its nature, tends to add excitement to any race, owing to its many dangerous corners.

The next important event from a political point of view after the Motor Car Act of 1903 was the appointment of the Royal Commission on Motor Cars. This Commission, which was to consider the alterations advisable in the Act of 1903, which expired, but was renewed on December 31st, 1906, came into being in August of 1905. It had as its chairman a former Speaker of the House of Commons, Lord Selby, and probably no better chairman could have been found, combining as he did great clarity of mind and legislative ability, with a naturally judicial temperament. The Commission took evidence from all parties interested, considered the law of other countries, even sending Commissioners abroad to study the conditions of motor-car traffic there, and eventually produced a report in the following year, May, 1906, in which, with two dissentients, they recommended the abolition of the speed-limit, relying for public safety on Clause I. of the 1903 Act, in which the Commission recommended some small alterations. They also advised the raising of the scale of taxation on motor-cars, and recommended some other rather less important changes. The Unionist Government had, however, resigned office in December, 1905, and the new Liberal Government had come in in January, 1906, with a large majority, pledged to all kinds of so-called social reforms. As regards motor-cars, they considered, probably rightly from a Parliamentary point of view, that the wisest course would be to extend the Motor Car Act for at any rate another year, and it was therefore included in the Expiring Laws Continuance Bill in the following July, and has thus been extended year by year to the present time. The recommendations of the Royal Commission, though distinguished for common sense and moderation, did not appeal to the majority of the House of Commons, who had but little practical acquaintance with automobilism, and had other and more important matters of a political character to bring forward. Mr. John Burns, the President of the Local Government Board, was probably quite right, therefore, when he decided not to alter the present law, but to let matters slide till public opinion had time to come round, and to become more reasonable as regards self-propelled vehicles. Mr. Burns, himself an engineer, at this and other times displayed great fairness of mind towards automobilism. One of the interesting points about the report were the tables produced giving the estimated number of motor vehicles registered in the United Kingdom at different periods. In December, 1904, the figures given were as follows:—

Motor cars	Motor cycles	Total
24,201.	27,348.	51,549.

The increase in their numbers is shown by the following:—

May 1906—	Motor cars	Motor cycles	Total
	44,098.	42,438.	86,638.

An increase of over 50 per cent. in one year and a half in the total number of motor vehicles is thus shown, and it will thus be seen what tremendous strides were made in the general use of motor-cars as a means of conveyance between those dates.

PRIX DE FRANCE, BROOKLANDS, 1908.

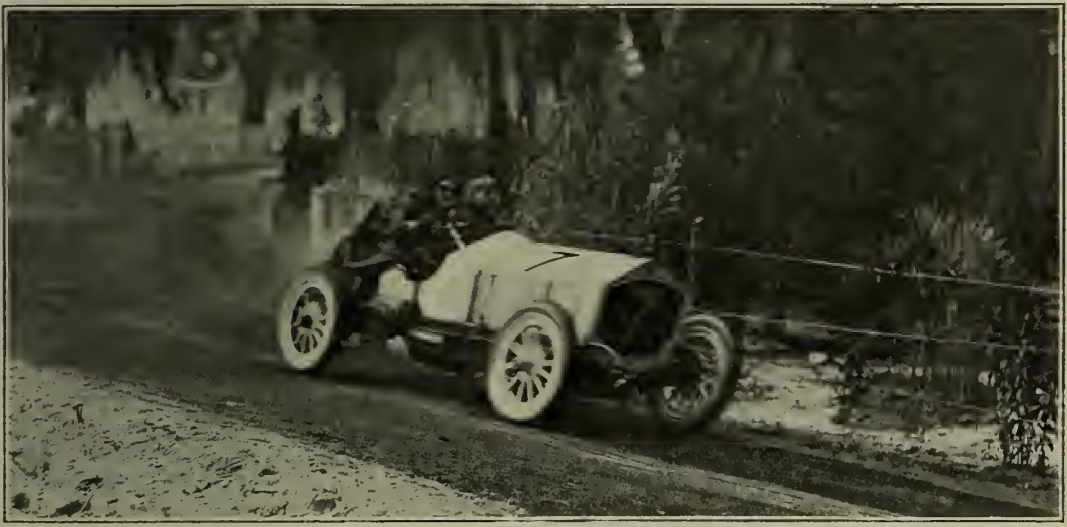
The Royal Commission also considered and reported upon another subject of immense importance to the general public and motorists alike, viz., the dust nuisance. There can be no doubt about the dust-raising properties of the motor-car, and in a minor degree mud-splashing as well, both of which have been causes of its unpopularity with the public. Its greater speed has been by now more or less accepted, as often as not arousing interest and amusement, but the dust nuisance has become greater with every succeeding year, owing to the great increase in motor-cars, and there is no doubt that dwellers on the roadside and other users of the highway have had a great deal of justification in their complaints against the prevalence of this dust nuisance. But it should be noted first of all that motorists do not create dust; they only raise it after animals and other vehicles have created it, and the majority of the general public seem to forget that dust existed at all before the motor-car came into use. A hundred years ago our ancestors were endeavouring to find a remedy for the dust nuisance, and the principal coaching roads at the beginning of the nineteenth century were regularly watered in order to allay the clouds of dust which were raised when the galloping coaches used them during the periods of dry weather. Even now, eighty to a hundred years afterwards, the roadside pumps are visible on most of the main roads leading out of London. The Portsmouth Road, the Bath Road, the Great North Road, and others, all bear witness to the fact that the roads in dry weather were regularly watered, even though the population living by the side of them was nothing like so great as to-day, and though only about half the population of to-day existed to use the roads.

The importance of experimenting with a view to finding out how dust could be permanently laid, as apart from the use of temporary palliatives, such as watering, the effects of which wore off in a very short time, varying from an hour or two to one or two days, was soon impressed upon those who were leading the automobile community. The Automobile Club had, through Mr. Claude Johnson's efforts, carried out in 1901 and 1902 some very interesting experiments, being assisted by Colonel R. E. Crompton and others, who had made a special study of the question of road-making and construction in general, and in 1904-5 Mr. Scott Montagu (Lord Montagu) initiated the Anti-Dust Fund through his journal *The Car*, which collected nearly a thousand pounds. Through this means he supplied to highway authorities in different districts various dust-laying fluids, such as westrumite, calcium chloride, and other mixtures, and gave grants towards the expense of laying down such road metal as tarmac to various highway and district councils and authorities. During this period the Motor Union, at the instigation of its secretary, Mr. Rees Jeffreys, an enthusiast on road improvement, also carried out more very useful experiments, and the attention of road surveyors was continually directed to the possibility of making roads dustless, either temporarily or permanently, and it was generally agreed that tar or tar fluids in some form were the best for achieving such results. Towards the end of 1905 Mr. E. Purnell Hooley, County Surveyor for Nottinghamshire, invented and patented a material called tarmac, which consisted of iron slag thrown hot into tar, the tar afterwards being drained off, and the metal used in the ordinary way for road-making. The effect of this was to impregnate thoroughly the slag, which was of a porous nature, with tar oils, and to make it therefore waterproof and dustless. Some hundreds of miles of road were made of it with marked success —notably the new Madeira Road at Brighton, where, in order to prove its absolute dustlessness, speed trials under the patronage of the Brighton Corporation were held in the summer of 1905, and it was seen that after the passage of the swiftest cars no sign of dust was at all apparent. A stretch of the Victoria Embankment opposite the Savoy Hotel was also laid with ordinary macadam tarred, and this stretch, which was subjected to the same traffic as the rest of the roadway, was proved to outlast ordinary macadam two or three times. In August, 1909, the whole of the Thames Embankment was laid with this tarred material, the use of ordinary macadam being entirely discontinued. It is interesting to record that the London County Council returns show that the keeping up in the old style of this piece of roadway used to cost £40,000 a year, a figure which has probably now been reduced by half, if not by two-thirds, owing to the use of the new material. It was calculated in 1909 that no less than 2,500 miles of main road were tarred in London and the home counties, while during the summer of 1910 probably about 4,000 to 5,000 miles were added to this figure. In Kent, in parts of Surrey, Hampshire, Buckingham, and Berkshire, the roads have been either tar-painted or tarred material has been laid down, particularly through villages or near residences which are situated on the edge of main roads. There is no doubt as to the marked success of this treatment, both from the point of view of expense of road upkeep, and this absence of dust has been a great boon not only to the population dwelling by the roadside, but to the road-using public as well. The revenue which the counties have obtained from motor-car registration fees and licence fees have no doubt helped very largely to pay for these experiments and treatments, and for the slight difference between tarred and untarred material, amounting to between 2*s*. 6*d*. and 5*s*. a ton.

When it is remembered that each car pays a registration duty of £1 1*s.*, and an annual driving licence costs 5*s.*, it will be seen that the automobile community, even if it has caused a good deal of damage to the roads and extra expense to the road-repairing authorities, already provides something towards the anti-dust treatment of roads, in addition to the sum of £750,000, which the Budget of 1909 levied from motorists towards highway and local expenses.

Up to 1905 the automobile community was represented in a corporate sense by the Automobile Club alone, and its democratic ally, the Motor Union, which was closely connected with it. But gradually it was held by many automobilists that the Club was not taking sufficient steps to protect motorists from the growing and unjust system of police-trapping which had become so prevalent in the home counties. Indeed, no motorists felt secure, however slow they were driving, from becoming a victim to deliberate unfairness on the part of the police, whose main idea, in Surrey and Sussex in particular, was to make a "bag" by every possible means in their power. The Automobile Association thus came into existence as an independent body in July, 1905, especially constituted to deal with the road aspect of automobilism, the original prospectus containing the following words: "To protect and advance the legitimate interests of motorists, and in particular to assist in the enforcement of the laws affecting the highways and the users thereof."

Gradually, the Automobile Association has covered the whole of England with a network of agents who are ready to advise travelling motorists of any points of danger and to tell them where special caution is necessary. The Automobile Association claim with justice that they have never in any way encouraged furious or inconsiderate driving, and their inspectors have over and over again reported cases where motorists have behaved badly to the public, and have often in such cases co-operated with the police and brought the offenders to justice. The coming of this body into the arena was naturally looked upon with some suspicion by both the already existing bodies, the Automobile Club and the Motor Union. It was also maintained by a large number of magistrates and some of the police authorities that the warning of motor-cars in the neighbourhood of traps would be held illegal as being an obstruction of the police in their duties, and would be severely condemned by the Courts. But the decision of the King's Bench in Bastable *v.* Little, where an agent of the Automobile Association was prosecuted for illegally obstructing the police in the execution of their duty, proved that individual motorists may warn other motorists of the existence of "traps," and be entirely within the four corners of the law. Other more recent decisions, though condemning conspiracy to defeat the police, have confirmed this view. From then until now the Automobile Association has had an unbroken series of success, and has enrolled over 14,000 members, thus forming the largest individual automobile corporation in the world, for the Royal Automobile Club has not more than 5,500 actual



ZIEGLER ON ACME CAR, ISLE OF HOPE, U.S.A.

members, though the roll, counting its associated members as well, brings the total up to 12,000 more.

In its special province of attending to the wants of touring motorists and attending to the roads, the A.A. has been very successful, and while interfering but little in the main politics of automobilism, it fills a want which is fully recognised. Some rather cheap sneers are sometimes levelled against it as an illegal body on account of its too successful attempts to defeat the unfair tactics of the police. But it should be remembered, that in order to defeat unfair methods, it has been driven to adopt counter remedies, which perhaps are not in all cases quite justifiable. But, on the other hand, it has been clever enough to secure acquittal, on all occasions when it has been convicted, on appeal to the higher courts. If the speed-limit is ever seriously increased or abolished, it will be largely due to the efforts of the Automobile Association, which has practically shown up the police-trapping system and the absurdity and injustice of the majority of the cases brought under Section IX. of the Motor Car Act of 1903.

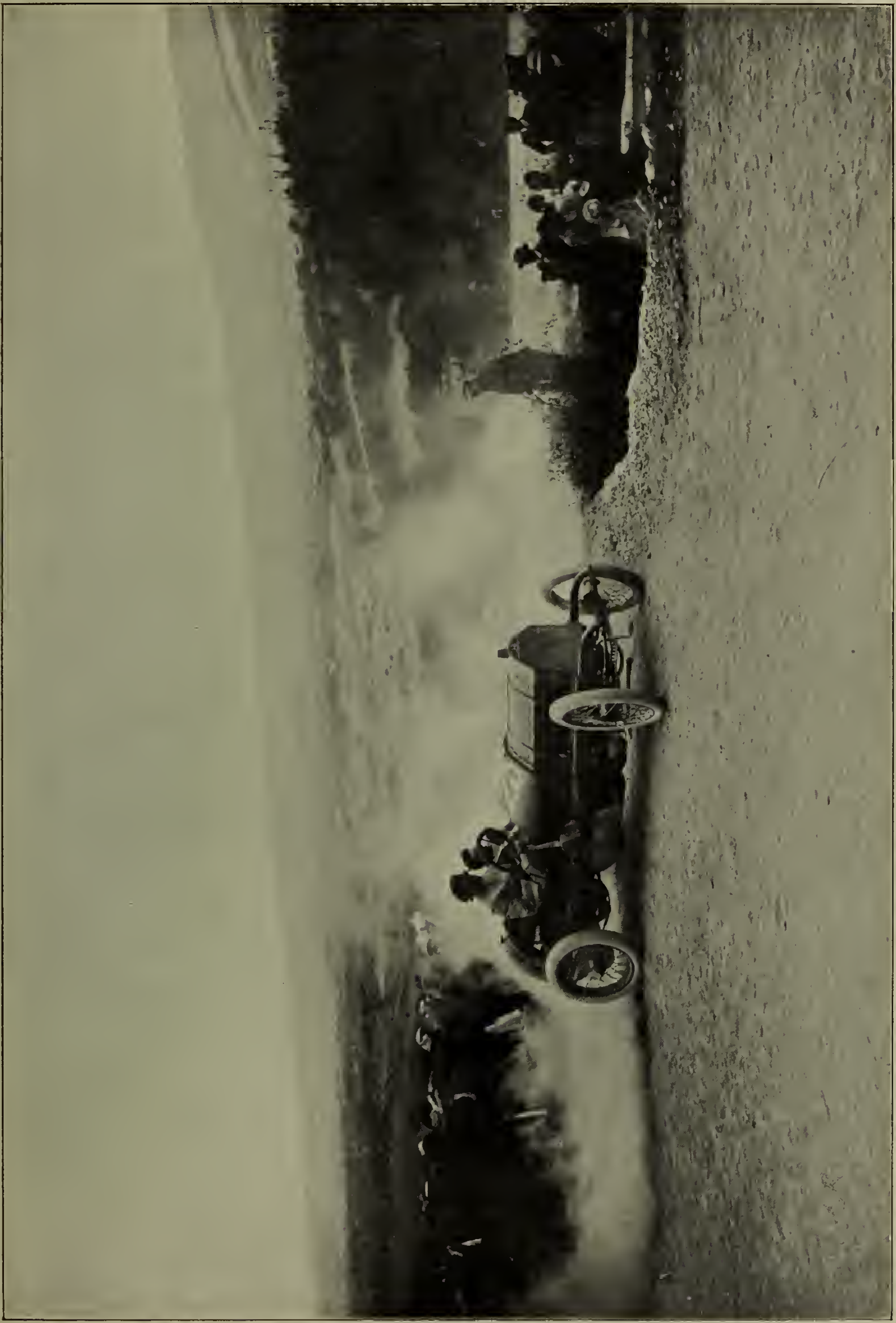
The Motor Union, which was for a long time an integral part of the Automobile Club, became an independent body in 1907, and its membership roll numbers over 13,000. It has made a special point of advocating the legislative interests of motorists, and its energetic secretary, Mr. W. Rees Jeffreys, has from the start devoted himself to matters of road construction, and has achieved considerable success in forwarding the interests of motorists amongst county highway authorities. It claims to represent the democratic side of motoring, and is very popular among motorcyclists and the owners of small cars. Under Mr. Joynson Hicks's able guidance, it has done well, and seems now to be established on a firm basis.

1905.—In this year the Tourist Trophy Race was organised by the Automobile Club as a contest for cars of the touring type, and it was open to members of foreign and affiliated clubs to participate. The course selected by the Club was that on which the Eliminating Trials for the Gordon Bennett Race were held in the Isle of Man. The total distance was about 208 miles 4 furlongs. Controls were eliminated on the course, but flagged portions were marked off in villages and at dangerous spots in which the competitors were forbidden to pass each other. Fifty-four competing vehicles entered—cars of English manufacture or those who had English agents. Petrol consumption entered largely into the marking system. The regulations provided that the petroleum spirit used should have a specific gravity of 0.695 to 0.705, and one gallon for every 22½ miles was allowed. Many of the competing vehicles dropped out of the running at the end of the third and beginning of the fourth lap for want of petrol. An Arrol Johnson car of 18 h.p., driven by Mr. John Napier, came in winner, covering the course in 6 hrs. 9 mins. 14 secs. —average, 33.9 m.p.h. Sixteen out of the eighteen cars which finished were of British manufacture, so the race was a satisfactory testimony to the endurance and economy of British cars.

The contest for the *Graphic* Trophy, which was presented by the proprietors of the *Graphic*, was to have been run for the second time in connection with the Isle of Man Race, but was postponed owing to the misty conditions of the weather.

The conditions for the 1906 contest were altered in some instances, one gallon of petrol being allowed for every 25 miles, the weight of the chassis allowed to be not less than 1,275 lbs., and the load carried not less than 1,125 lbs. The Club reserved the right to disqualify a vehicle which did not conform with the ordinary touring type of car. The manner in which the regulations were framed limited the average speed which the car could attain by reason of stated weight and limit of fuel, but the award went to the vehicle covering the course in the shortest time.

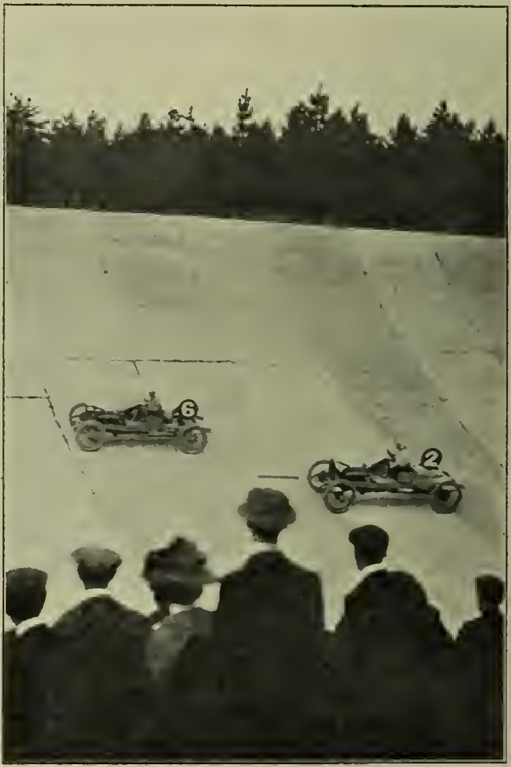
The course was somewhat altered from that of the preceding year, being only 40 miles 6 furlongs in length, the four requisite laps making 163 miles. Forty-nine cars, amongst them fourteen cars of French manufacture, were entered, but many were withdrawn after preliminary trials on the course. It was observable that to cope with the hilly course a four-speed gear had been generally adopted. The average horsepower of the cars was not more than 20, some being as low as 10 h.p. The *Graphic* Trophy contest preceded the Tourist Trophy Race, and was run over a hilly course. The victory fell to a 50-h.p. Napier car, which attained a speed of over 55 m.p.h. The Trophy was won on the first occasion by a Humber car at the hill-climbing contest at Castlewellan, in Ireland, in 1903. Though the cars running in the Tourist Trophy Race were of comparatively low horse-power, some very fine running was made—too fine for some of the competitors, who found themselves completely out of the race with their petrol tanks empty. The result was a popular win for the Hon. C. S. Rolls on a 20-h.p.



La Course du Mont Ventoux. A Dangerous Turn.

Rolls-Royce, whose car, after having run with remarkable regularity, came in victor. The average speed for this little four-cylinder car worked out at 39½ miles an hour. The measurement of petrol at the finish of the race produced some interesting figures, most of the finishing cars having very little left over. It was found that the winner had less than one pint when he crossed the line. Further alterations were made in the conditions governing the race for 1907. The distance to be covered was increased to 240 miles, the rule fixing the minimum weight of chassis was deleted, and the weight of load carried increased. Every competing car was required to demonstrate that it was capable of being stopped and restarted in ascending a hill of 1 in 6 on a forward gear. With each year the importance of the Tourist Trophy Race increased. Not only was it looked upon as a manufacturers' test and a guide to the reliability and economy of the various cars, but also as an annual sporting event—in fact, the biggest of race meetings held on British soil. The 1907 meeting combined three events—a race for motor-cycles, the Tourist Trophy Race itself, with a heavy touring car contest combined; and the shorter race for the *Graphic* Cup. The first event, the motor cycle race, produced an exciting struggle between very evenly matched machines. One machine, a 3½-h.p. Brown cycle, did a remarkable performance by covering 119 miles to a gallon of petrol. The Tourist Trophy Race itself had become a drastic trial by reason of the stringent regulations over a not too easy course, but, as pointed out before, speed was by no means the only factor taken into consideration by the Royal Automobile Club in these competitions. The race was run in particularly inclement weather, a heavy mist hanging over the course. The regular running of a small Rover car enabled its driver, Mr. E. Courtis, to bring it in as victor and to win for both car and driver much admiration in accomplishing the run. The reward was well deserved when it was remembered that only two cars out of twenty-two starters completed the course. The other, a 16-20 Beeston Humber was the winner in the heavy car section. The Rover car's average speed worked out at 28.9 m.p.h., and it finished with just one pint of petrol in the tank. The *Graphic* Trophy was carried off by Mr. Hutton on a 60-h.p. Berliet car, which covered the test hill near Ramsey in 3 mins. 40 secs.

The first contest for the Herkomer Trophy also took place in 1905 under the supervision of the Bavarian Automobile Club. For this competition a trophy was presented by Professor Von Herkomer valued at £500 for first prize, and was to be competed for in three annual races, to be won twice by the same competitor before it became his property. If not won twice by the same competitor, the cup was to be raffled for by the three winners. All recognised automobile clubs were allowed to send entrants. The route for the first year over which this contest took place lay from Munich to Baden-Baden for the first stage, Baden-Baden to Nuremberg for the second, and back to Munich for the third. One hundred and five competitors started on this interesting run, including several cars of British manufacture, the Daimler Co. sending five cars, which accomplished a very creditable performance. Hill-climbing on the Kessalberg Pass was included in the programme, a steep incline of 7 kilometres in length. On this gradient Mr. Clarence Gray Dinsmore's 70-h.p. Mercédès made the fastest running (7 mins. 29 secs.). The first prize was gained by Herr Edgar Ladenburg, on a 40-h.p. Mercédès car.



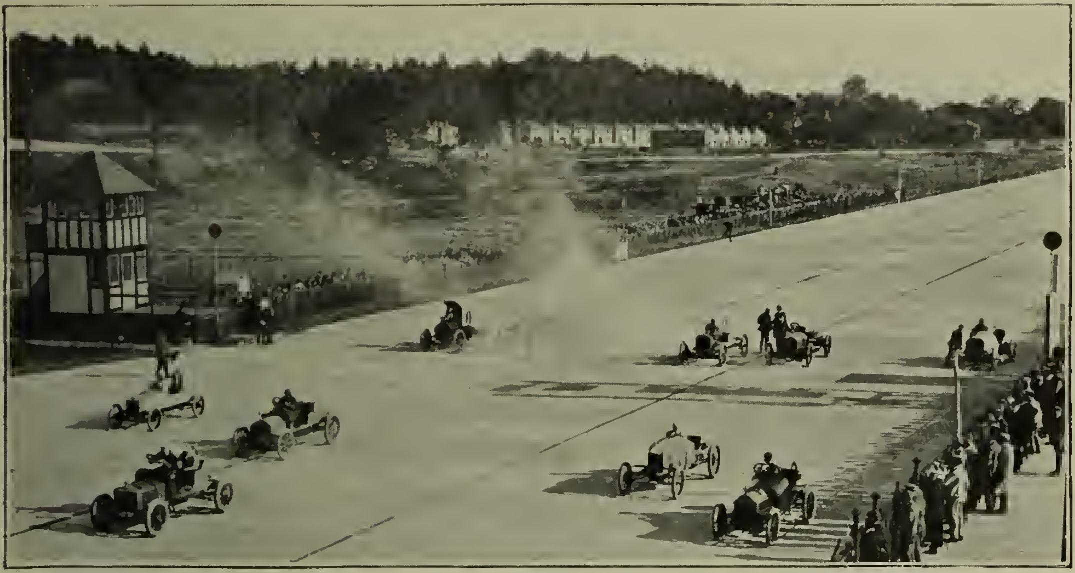
O'GORMAN TROPHY, BROOKLANDS, OCTOBER, 1909. THE TWO VAUXHALL CARS WHICH LED THROUGHOUT.

Mr. Glidden, a prominent American motorist who has become well known to the automobile world as the "Globe Motorist," having travelled round the world more than once on his Napier car, offered a prize, the Glidden Trophy, for an American Reliability Test in 1905. This trial took place in August over some 870 miles of American roads. Thirty-three vehicles started, and only five failed to finish the run, ten of the competitors completing this arduous tour without loss of marks. The trophy was won by Mr. Percy C. Pierce, who drove a 40-h.p. Pierce Arrow car.

The various Continental competitions for the purpose of testing the reliability of cars grew more difficult as the cars became more and more perfect. The contest for the Pyrenees Cup in August (in France) was over an extremely difficult route, and plainly demonstrated the capabilities and endurance of the touring class of cars. The trial extended over eight days, a distance of 820 miles being covered. An entry list of sixty-one vehicles resulted in an imposing start from Toulouse, the majority of cars being of French manufacture. Fifty-three cars finished, the prize being secured by M. Sorel on a 40 h.p. De Dietrich. A team prize for the best team performance was won by the Brouhot cars, who took four places within the first ten names.

The 1905 Ardennes Circuit was, as usual, the scene of some very fine performances. The circuit measured 75 miles, and for the purpose of this race had to be covered five times. The entries numbered nineteen, but the three Fiat cars entered by Italy, and the two Wolseley cars by England, withdrew just before the race, and therefore fourteen cars started out on this contest. The struggle took place between four Panhards, three Darracqs, three De Dietrichs, two Mercédès, one C.G.V., and one Itala car. The drivers of these cars were culled from the best racing blood of their respective countries, and, after an exciting race, Hemery, on a Darracq (French) car, came in victor, covering the course in 5 hrs. 58 mins. 32 secs.—average speed, 62½ m.p.h.—a very fine performance.

The Brescia meeting in September took the form of an exhibition of cars, and motor-boat races on the Lake of Garda, with the race for the cup, which was styled the Florio Cup, after its donor, as a final. The road race was held over the Brescia circuit, a triangular course of 507 kilometres. The majority of the entrants were, naturally, Italian, but the French racing men were also in evidence, Hémery, the winner of the Ardennes circuit, taking part in the race, and bringing several of his fellow-motorists. The result of the race was somewhat unexpected, for the Italian driver, Raggio, picked up rapidly towards the end of the contest, and came in winner. Raggio drove an Itala car, and his time over the course was 4 hrs. 46 mins. 47 secs.—an average of 62 m.p.h. The Itala firm also carried off the Salemi Cup, which was offered as a team prize.



Brooklands Meeting, 1909. Start of Relay Race.

The Continental cars were not, however, successful in every test abroad, for at the annual Chateau Thierry Hill Climb in October, 1905, Clifford Earp, on a

6-cylinder Napier car, secured the first place. The distance this year was altered to 1 kilometre in place of the previous mile; the gradient is 1 in 10, and the regulations necessitate a standing start. The Napier car ascended this incline in 38 secs. Again, at the Dourdan speed trials, the Napier driven by Earp made the best time in its class, covering a flying kilometre in 25⅗ secs., though this running did not come up to his performance on the track in England at Blackpool and Brighton.

The big racing event in America in 1905 was the second international race for the Vanderbilt Cup. The contest was run over the Long Island circuit, specially prepared, passing through the estate of Mr. Vanderbilt, the donor of the cup. The number of entries received from American firms necessitated an eliminating race, and this took place a few weeks before the race. The test was held over the same course, 28¼ miles in length, but was only covered four times, whereas in the actual race the laps were ten in number, making a total of 282½ miles. Five cars from each competing country formed the team. England was not represented, while France's representative team consisted of a Panhard (Heath), Renault (Szisz), two Darracqs (Hémery and Wagner), and a De Dietrich driven by Duray. The Italian team were all Fiat cars, driven by Lancia, Nazzaro, Cedrino, Sartori, and Charolet. The well-known racing men, Jenatzy and Foxhall Keene, were amongst the German team. A keen struggle was waged through the race between Heath (Panhard) and Hémery (Darracq), the latter coming in victor, Heath being only 3 mins. 32 secs. behind, thus securing a double victory for the French cars on American ground. A locomobile car driven by Tracy, one of the American team, secured third place. Hémery's average was at the rate of 63 m.p.h.

Efforts to reduce records further resulted in some fast running by American cars on the Ormond Daytona track in the early part of 1906. A flying kilometre was said to have been covered in 18⅖ secs. by Marriott on a Stanley steam car, which works out at a speed of 122.2 m.p.h., and the mile with standing start was accomplished in 28⅕ secs. (127.5 m.p.h.). These records have since been challenged as to their accuracy.

In July some very interesting events took place in England on the Brighton track, when Clifford Earp, on a 90-h.p. Napier, covered the flying kilometre in 23⅕ secs. The two-mile track at Blackpool also witnessed some very fine performances when Earp attained a speed of 104½ miles an hour when covering a flying kilometre, and thus tied with the world's record achieved by Baras on a Darracq car at Ostend.

1906.—In connection with the Milan Automobile Exhibition in the early part of the year, a contest was held which opened the Continental events for the year. The Coupe d'Or presented by the city of Milan, a trophy from the King of Italy, and numerous cash prizes, produced a big entry list. The itinerary covered the best roads in Italy, and was run for eleven days, the distance measuring some 3,867 kilometres. Fifty-one cars started, eleven Italian firms competing, four French, three German, two English. Owing to the dangerous and steep nature of many of the roads traversed, numerous cars were put out of running by overturning and other accidents. The Gold Cup was won by a Fiat car, Lancia, the renowned Italian driver, at the wheel. The two English Napier cars competing took sixth and seventh prizes.

The race for the Targo Florio, which took place on May 6th over a mountain course in Sicily, was also gained by an Itala car, driven by Cagno.

The Hon. C. S. Rolls also in May ran one of the small four-cylindered 20-h.p. Rolls-Royce cars from Monte Carlo to London, a distance of 771 miles, in 28 hrs. 14 mins., thus beating Mr. Jarrott's previous record of 31 hrs. 35 mins.

The Ardennes Race for 1906 had an entrance list of twenty-eight vehicles. The course covered was 375 miles, and after an exciting struggle the first prize was won by Duray on a De Dietrich car in 5 hrs. 38 mins. 39 secs. It was noticeable that at this meeting all the competitors had provided their cars for the first time with detachable wheels and rims, thus obviating delay for tyre punctures.

Provincial clubs held numerous hill climbs and speed tests during the summer, and amongst them may be mentioned flat racing on Saltburn beach, organised by the Yorkshire Club, when the 100-h.p. Darracq car driven by Mr. Wright attained a speed of 96½ miles an hour.

1906.—Dourdan, the scene of many former speed trials, this year witnessed some marvellous speeds. Mr. Lee Guinness, on his 200-h.p. Darracq, covered a flying kilometre in 20 secs., a speed of over 112 miles an hour, beating the European record up to that date.

As regards the Vanderbilt Cup Race in 1906, the American team selected after an eliminating race on the track consisted of the following five cars: 120-h.p. Pope

Toledo, 115-h.p. Thomas, 110-h.p. Locomobile, 70-h.p. Christie, and 60-h.p. Haynes. The European contingent was a formidable one, representing some of the finest cars and drivers of the day, and consequently an exciting contest was witnessed on the Long Island track. 297¼ miles was the distance over which the race was run, the victory falling to Wagner (France) on a 100-h.p. Darracq car. His time was 4 hrs. 50 mins. 10 secs., an average speed of 61.43 m.p.h., an extraordinarily fine performance considering the nature of the track. Lancia, on a Fiat (Italian) car, came in second, being 3 mins. behind the time of the winner. Despite the utmost precaution for safety taken by the Cup Commission, the race was somewhat marred by several accidents to spectators, the public crowding on the course and hindering the running of the racing cars.

On November 14th an interesting dinner took place in London, at which were gathered most of the pioneers of the motoring industry to celebrate the first decade since the passing of the Light Locomotives Act, and the repealing of the "Red Flag Act."

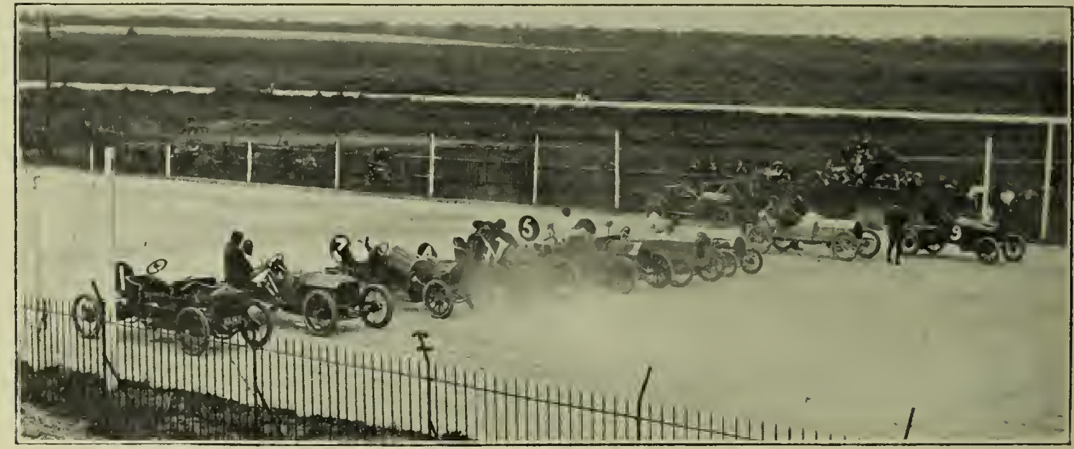
The French Grand Prix of 1906 made the racing world all agog with excitement over the Sarth circuit near Le Mans. Thirty-four competitors entered for the struggle, which was a fierce one, and on which it was felt much of the success of future motor racing depended, and the reputation of the firms taking part. The race extended over two days; the course, 64½ miles in length, was covered six times each day, a total of 774 miles. French manufacturers accounted for all the entries but nine, and it was left to a Frenchman, Szisz, on a Renault, to carry off the coveted prize. Eleven cars finished the arduous two days' running.

How a Low Chassis affects the Dust on an Unprepared Road.

Professor Von Herkomer's Trophy contest was run in June, and extended over a long route, 1,660 kilometres in length, including a hill climb up the Semmering Pass, near Vienna, and closing with a speed trial in the Forstenrieder Park, near Munich. Professor Von Herkomer, when initiating the contest, had intended that it should primarily encourage amateurs and be a trial for genuine touring cars. Many of the foreign cars entered for the 1906 contest did not fulfil these conditions at all; racing cars with aluminium seats, devoid of steps and doors in many cases, could hardly be termed touring cars. The starters from Frankfort to Munich numbered 140 for the first day's run, but tyre troubles and disregard for the regulations against excessive speed saw the number somewhat diminished before Munich was reached. Almost every country interested in, or building, motor-cars was represented. Prince Henry of Prussia, an enthusiastic motorist, participated as a competitor in the contest. The second day's run was from Munich to Linz, and the third on to Vienna, where the cars remained a day on exhibition. The next run, to Klagenfurt, included the somewhat trying contest on the Semmering Pass, where hill-climbing trials were undertaken. The fifth day brought the competitors to Innsbruck over the Brenner Pass, and the sixth witnessed the return to Munich, and a speed trial of 5½ kilometres as a final to the tour. The best speed in these trials was attained by Herr Poege, on a 60-h.p. Mercédès, who covered the distance in 3 mins. 8 secs. The winner of the 1906 contest was Dr. Stoess, on a small car, who drove an 18-h.p. Horch. English Daimler cars were well represented, but in most cases English competitors did not do remarkably well. Mrs. Manville, an English lady, who the year before had won a prize in this contest, was again successful, and Lord Montagu won a gold medal. Professor Von Herkomer expressed dissatisfaction at the way in which the regulations had been ignored, and types of cars permitted to enter which did not answer the required description.

The race on the Ardennes circuit in 1906 saw nearly all the competing cars fitted with movable rims, which subsequently became general in all racing cars. Twenty-one cars started in the race, all of them French with the exception of four Mercédès. The race was a very open one, and after some exciting running Duray, on a De Dietrich car came in winner, covering the course in 5 hrs. 38 mins. 39⅕ secs., thus beating the winner of the previous year, Hemery, by 19 mins. 53 secs., the average speed attained being 66 m.p.h.

A somewhat drastic yet interesting test was made at the end of July in the *Belgian Criterium.* The competing cars had to undergo a 585-miles trial on the roads, and journeyed from Spa, viâ Nimègne, Cologne, Luxembourg, Reims, to Dinant. The survivors of this trial were then entered for a 300-miles speed race. Twenty-nine vehicles started, seventeen survived the road test, and the speed trial was finally won by Rigolly on a Gobron car.



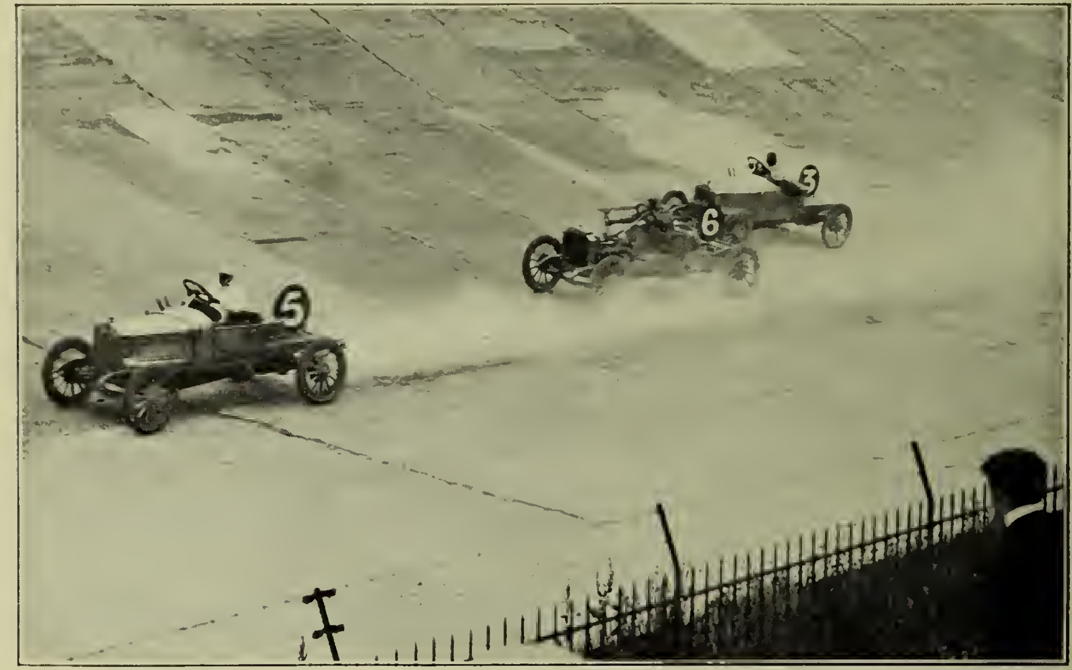
A BROOKLANDS MEETING IN 1909.

The desirability of removing motor-car racing and testing from the roads, and the difficulty of securing roads in private parks where the legal speed of 20 miles an hour could be exceeded without danger of police interference made the construction of a special track for racing purposes very desirable. Several projects had been put forward in 1905-6, but it was left to Mr. and Mrs. Locke King, both enthusiastic motorists, to materialise the idea. In the autumn of 1906, after consulting a good many of their motoring friends who were acquainted with the automobile industry, they decided to lay down a track which could be used for racing, and to form a club at Brooklands, their own property near Weybridge. The need for such a course had long been felt in the motoring world, not only from a sporting point of view, but as a testing-ground for cars, high racing speeds being obviously out of place on the public roads. Mr. Locke King's enterprise and courage in thus coming forward with the offer to undertake this colossal venture for the benefit of automobilism have earned him the thanks and gratitude of all the motoring world. The track is just over three miles in length, elliptic in form, with a straight mile at one end for the purpose of record running. The banking at the corners in some cases amounts to 28 ft. in height, while the track is 100 ft. wide, and the grounds, pavilions, &c., provide accommodation for over 100,000 people to witness the proceedings. Quite recently a test hill has been built in the grounds, forming a valuable addition to the track. In order to reduce danger to the public to a minimum, the track is railed off, and subways were built to avoid crossing from the outside to the inner ring. Altogether the cost of construction was somewhere about £150,000. The inaugural meet of motorists took place on June 17th, 1907, and the first person to use the Brooklands track publicly was the famous British motorist, Mr. S. F. Edge, who accomplished a run of 24 consecutive hours on one of the standard 60-h.p. Napier cars. This car, steered by Mr. Edge, ran from 6 o'clock on Friday evening, June 28th, to 6 o'clock on the evening of the 29th, and covered 1,581 miles 1,310 yards, averaging nearly 66 miles throughout the whole 24 hours. At night the course was illuminated. Mr. Edge was paced by two other Napier cars, which, however, ran under the charge of two drivers apiece. The fastest hour of this huge run was the fourteenth, when he covered 72 miles 150 yards. In order to obviate tyre trouble and subsequent delays, the cars were fitted with detachable wire wheels, which were quickly changed. In one instance a wheel was removed and another fitted within 24 secs. Special petrol tanks holding 50 gallons were fitted, so replenishment took but little time. The opening race meeting took place on July 6th, 1907, a record muster of spectators' cars being seen in the enclosure. Throughout the summer various race meetings were held under the auspices of the Royal Automobile Club, and in the following year, 1908, many interesting experiments of a technical and scientific nature were carried out on the track.

BROOKLANDS. RACE FOR THE MONTAGU CUP, JULY, 1909.

1907.—The Grand Prix for 1907 was run over the Dieppe course, the circuit extending a little over 50 miles, which was covered ten times. A race for the cup presented by the Commission Sportive of France was run at the same time, the starters in the latter event leaving two hours after the Grand Prix competitors. This race, the second Grand Prix, with its thirty-six starters representing five nations, was a brilliant event. The Targo Florio and the Grand Prix contests were now about the only two races left which brought motorists of all nations together. The victory after a hardly-fought contest went to Nazzaro on a Fiat car, who achieved the wonderful average speed of 71 m.p.h. over the whole circuit. The French manufacturers, who had, of course, entered the largest number of cars, had the satisfaction of seeing eight French cars finish in the first ten.

The third and last contest for the Herkomer Trophy was run in June, 1907. The assembly of cars, both competitors' and those of witnessing motorists, was one of the largest on record; 161 cars competed for the trophy; Germany had the largest representation, numbering 111, Italy 23, France 14, Belgium 8, England 3, and Switzerland 2. Four lady competitors also took part. The itinerary covered six days' running with a speed trial in the Forstenriede Park as in previous years. In this speed trial the highest number of marks was gained by Dr. R. Stoess on a Hotch car, who had won the trophy before in 1906. The trophy was eventually gained by Herr Ladenburg (who also gained first place for the contest in 1905), whose Benz car was driven by Fritz Erle. The next event was the first international race for the Kaiserpreis, a cup presented by the Kaiser for a race between cars whose cylinder volume was limited to eight litres. The race was run on the Homburg route, and extended over two days. The first day two laps only were run, and as soon as the first twenty cars in each heat had finished the circuit, the contest was stopped, as the finished twenty were selected as starters for the actual race. On the second day the circuit (75 miles) was covered four times. The Kaiser was present throughout the contest, and presented his cup to the winner, Nazzaro, on a Fiat car. Thus Italy again won laurels in the automobile world.



O'GORMAN TROPHY, BROOKLANDS, 1909.

Long-distance tests became more numerous. Among those for this year was the contest from Moscow to St. Petersburg, a distance of 646 kilometres, which was won by Duray on a 60-h.p. De Dietrich car. The Paris to Peking Race aroused much enthusiasm and a certain amount of sceptical criticism from those not fully acquainted with the capabilities of the modern motor-car. The difficulties encountered over an unknown route of 8,000 miles were enormous, yet most of the cars came through, and the first to reach Paris was Prince Scipione Borghese on an Itala car. This famous car and driver had crossed the much dreaded Gobi Desert in three days.

Italian meetings for 1907 opened with a race for small cars over the Sicilian circuit, a distance of 188 miles. The winner of the trophy, styled the Coupe des Voiturettes, was Naudin, on a Sizaire-Naudin car. The big contest for the Targa Florio took place in April in Sicily. The circuit, which had to be covered three times, measured 93 miles, and contained no less than 1,000 corners, many of them steep and sharp turns. This was won by Nazzaro on a Fiat car.

The Tourist Trophy competition was held, as formerly, in the Isle of Man, the petrol consumption again being taken into consideration. The trophy was won by a 20-h.p. Rover car. The "Graphic" Trophy Race which followed went to Mr. J. E. Hutton, who drove his 70-h.p. Berliet over the course (2 miles 3 furlongs) in 3 mins. 40$\frac{2}{5}$ secs.

The 1907 meeting of the Ardennes circuit was run on three days, the first race, run under similar conditions as the Kaiserpreis, was gained by Mr. Moore Brabazon on a Minerva car; the second, under a formula similar to that drawn up for the Grand Prix event, was won by Baron de Caters on a Mercédès car after a hardly-fought contest with Mr. Lee Guinness's Minerva.

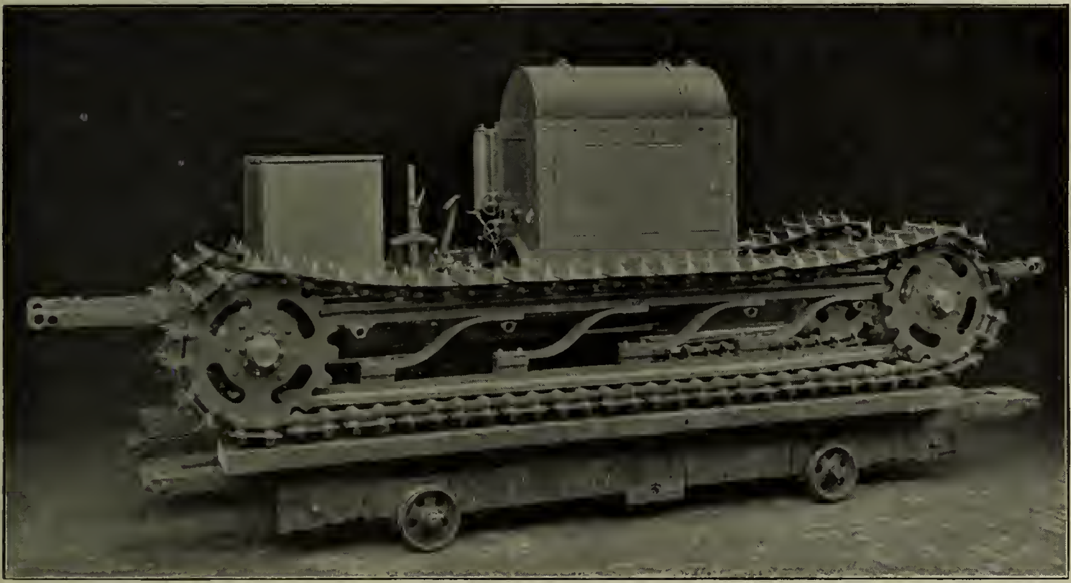
A twenty-four hours' contest was held in America, in which a 60-h.p. Thomas car covered 997 miles. The record fell short of Mr. Edge's achievement on the Brooklands track by 584 miles.

During the Brescia race meeting in September, an Itala car again secured the Florio Cup. Minoia, on an Isotta-Fraschini car, covered the 305-mile course in 4 hrs. 39 mins. 53 secs. The following day saw another Italian victory, Cagno, on an Itala car, winning the Coupe de Vitesse. Hill-climbing contests on the Continent were very numerous; almost every week-end throughout the summer witnessed one if not more of these ever-popular tests. At the annual test on Gaillon Hill, Newton, an English driver, on a 90-h.p. Napier, made the speed ascent in $26\frac{3}{5}$ secs.

1908.—February, 1908, saw the departure of the competitors in the New York-Paris Race, a tour practically round the world. The cars acquitted themselves well, and the Zust, steered by the Italian, Antonio Scarfoglio, made a remarkable journey.

Italy again won laurels in the American track race, a Fiat car, driven by Cedrenio, winning the 100 Miles Race. The cup presented by the Automobile Club of America was also carried off by Cedrenio. The one mile flying start was covered in 35 secs. by the winning car.

The Briarcliffe Trophy, another American prize, also went to Italy, being gained by an Isotta-Fraschini car. The Targa Florio Race took place in Palermo. Here, again, victory went to Italy. The St. Petersburg-Moscow Race at the end of May, 1908, was won by a Benz car.



THE MOTOR SLEDGE SPECIALLY BUILT FOR THE 1910 ANTARCTIC EXPEDITION BY THE WOLSELEY CAR AND TOOL MANUFACTURING CO.

Germany had instituted a tour called the Prince Henry contest, after the donor of the prize, which took the place of the Herkomer Trophy contest; 130 competitors entered for this trial, in which the highest marks were won by Fritz Erle on a Benz, the winner of the last Herkomer competition.

The Grand Prix of France was again competed for on the Dieppe circuit. Forty-seven entrants started, resulting in a thoroughly good sporting race. The prize was gained by Lautenschlager, on a Mercédès car, who covered the 470 miles in 6 hrs. 55 mins. 43 secs.

The preceding race for small cars was won by Guyot with a Delage car, a very fine performance for a small voiturette type of car. Ballot, on a Brasier car, beat the previous year's record on Gaillon Hill by $\frac{2}{5}$ sec. The Vanderbilt Cup, competed for on the Long Island track, was won by an American Locomobile car. The race for the American Grand Prize, which took place in November, was won by Wagner on a Fiat car, who covered the 397 miles in 6 hrs. 10 mins. 47 secs.

The Bologna race meeting resulted in a large entry list for both the Florio Cup and the Bologna trophy. The victorious Nazzaro again carried off the Florio Cup, while Porporato, on a Berliet car, became possessor of the Targa Bologna. During some speed tests made in France on a course between Salon and Arles, a Brasier car driven by Bablot attained a speed of over 104 miles an hour.

Up to the year 1907 the Automobile Club and the Motor Union had more or less worked together as two affiliated bodies, but as the more democratic body, the Motor

Union, increased in number, the official staff, its leaders, and a certain number of its members began to resent the supervision of the Club, complaining that their efforts were more often than not restricted, while the Club had on more than one occasion to take exception to the independent tone and action of its presumed allied body. The result of the strained relations was the cancelling of the agreement between the two bodies, and there arose much excitement in the British motoring world, especially amongst provincial club members, as to which body they should join. It was felt that such disruptions and quarrels amongst the leading bodies were not beneficial to the movement. The Automobile Club, which in the previous March had received the King's permission to use the prefix "Royal," had a membership of some 3,500, while the Motor Union, with its more democratic class of member and cheaper subscription, numbered 4,681 at the time of the severance from the parent body. A summary of the provincial clubs all over the country showed a list of 10,432 members. The outcome of the cancelling of the agreement between the two bodies resulted in the formation by the R.A.C. of a scheme for associate members, whereby provincial clubs could be associated to the parent body and enjoy many of its privileges, such as legal advice, the service of the engineering department, the right to participate in the open competitions and trials organised by the parent body, and the granting of the triptyque for foreign travelling. It was settled that the associated bodies should pay to the R.A.C. a capitation fee of 5*s.* per head, and the members were styled R.A.C. associates. The larger and more important bodies, such as the Scottish and Irish Automobile Clubs, and the Ladies' Automobile Club at once threw in their lot with the R.A.C., though many clubs decided to be affiliated to both bodies for the remainder of the year 1908.

The International Touring Car Trial, 1908, took the form of a test of 2,000 miles' running on the road, with a race of 200 miles as a finish on the Brooklands track. Though not a road race, these reliability tests, organised by the Club, have tended in all instances to teach useful lessons in reliability and economy to the manufacturers. The test was run in this case in conjunction with the Scottish Reliability Trials, an annual contest organised by the Scottish Automobile Club.

The race termed the "Four Inch Race" was organised for competing cars of certain type, fitted with four cylinders, the rating of which should not exceed 25·6 h.p., with bore not exceeding 4 ins. The distance covered in the race was about 300 miles. The British cars, which were naturally in the majority, had to meet several well-known makes of Continental cars on the course. Belgium, France, Italy, and Switzerland were all represented in this year's Manx Race. Some excellent running was made on the nine laps of the course, and the winner, Mr. J. Watson, on a Hutton car built by Messrs. Napier & Co., covered the course in 6 hrs. 43 mins. 5 secs. The next two cars to pass the winning-post were of French manufacture, two Darracqs, which were only some 2 and 5 mins. behind the winner.

Amongst the many arduous trials undertaken by motor-cars must be mentioned the New York-Paris contest, which took place in 1908. Several European cars were entered in this trial, amongst them being a De Dion driven by M. Bourcier de Saint Shaffray; a Motorbloc, driven by M. Godard, who steered the Spyker car in the Peking-Paris event; a Zust car, steered by Prince Scarfoglio; a small Sizaire Naudin, a Werner car, which, though not competing, was making an independent journey between the two points; a Protos car entered by a German firm; and three American machines—a Thomas, Maxwell, and Hol-Jan.

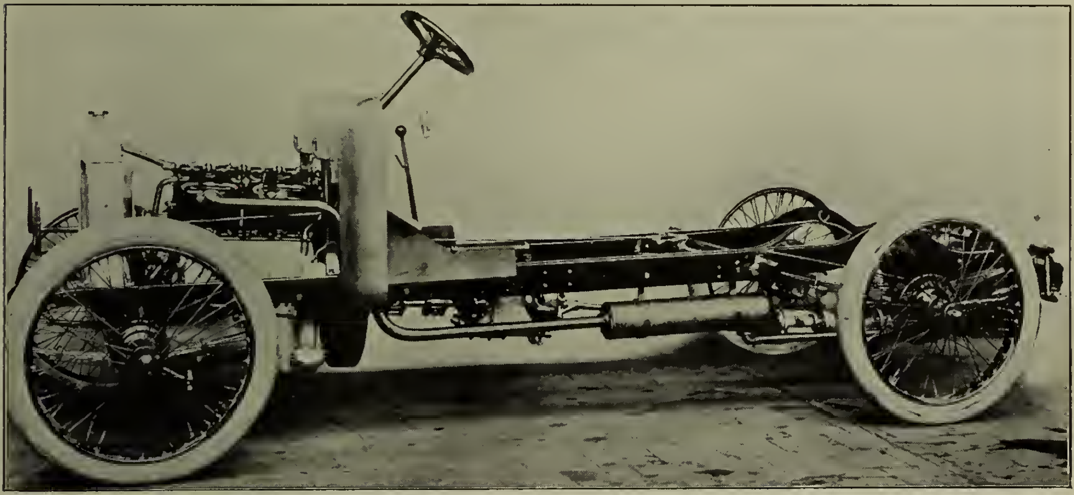
1909.—The Florida race meeting, 1909, saw many records broken. The Five Miles Open Race was won by a Benz car in 2 mins. $45\frac{1}{5}$ secs. The Five Miles Motor-Cycle Race also resulted in the amateur record being broken, as the distance was covered in 3 mins. $30\frac{1}{5}$ secs. The hour record test for motor-cycles resulted in the covering of 69 miles in 58 mins. 25 secs. In March of this year Leon Théry, the famous French racer, died, and France lost one of her best drivers. After having been closed as the scene of a contest since 1903, La Turbie Hill was again opened in April, and some excellent results were attained. Big road racers were growing fewer, and entries even for worldwide-known events were not so numerous, and it was evident to all in the motoring world that the days of big motor road racing were on the wane. The Targa Florio had this year only twenty entries. The chief French motor-car firms had signed an agreement not to race, so the entrants were all amateurs. Only one round of the circuit was covered, a distance of about 95 miles. The race was keenly contested, and was won by an Itala car, driven by Baron Crieppa. The fifth contest for the Coupe des Voiturettes was run over the Boulogne circuit in June, and some very fine running by the smaller type of racing cars was seen. The winner, on a Peugeot car, averaged over 50 miles an hour throughout the contest.

Having given the chief racing events in the motoring world, and thus demonstrated the great advancement made in the modern motor-car, we will now give a few instances to show how the holding of these race meetings has tended to improve the construction and reliability of the car. Just as horse-racing has tended to the production of an animal capable of galloping at great speed, strong in limb, light in weight, and with great staying powers, so has the manufacturer of a car in endeavouring to beat his competitors turned his attention to the production of vehicles capable not only of high speed, but of great reliability.

A Four-cylinder Noiseless Napier, specially adapted for Colonial use.

MECHANICAL. — **The Mechanical Development of the Motor Engine.**— As regards the development of the mechanical side of the motor-car, a too technical description would be out of place here, but some facts will be set out which will give a general idea of the lines on which this development proceeded. First of all, it must be remembered that the early steam carriages of Hancock, Gurney, and others to some extent laid the foundation for mechanical road propulsion, though, of course, it was not till what is called the Otto cycle was found out and adopted for general use in gas and petrol engines that the internal combustion engine, acting by means of a series of explosions, became a practical machine. To deal with the small number of motor-cars which are still propelled by steam, it need only be remarked that the "flash" boiler was really the important invention in this case, as it enabled a great deal of steam to be raised from very small weight of water-tube boiler and quantity of water, and, owing to the adoption of the principle of the thermostat, automatic regulation according to pressure became possible. Otherwise the steam engine itself, which propels the majority of steam motor vehicles to-day, differs very slightly from any other steam engine, except that in some cases it is fitted with only single-, not double-acting valves. As regards electric cars, these have not shown much progress except in the matter of body work, springs, chassis, &c. The storage battery of to-day is not much better either in efficiency or weight compared with the accumulators of ten or twenty years ago. It is always being announced that Mr. Edison, of America, has at last invented a perfect battery. But so far his discoveries are confined to newspaper rumours, and the perfect battery usable under ordinary conditions has not yet been seen.

We will now deal with the internal combustion engine, which propels probably something like 98 per cent. of the motor-cars in use to-day. As already mentioned, the principle of the Otto cycle was first fully developed at the hands of Gottlieb Daimler. It was in 1884 that he patented, after a series of valuable experiments, a small gas-engine which was made to run at a comparatively high speed, the ignition being supplemented by a tube called the ignition tube or priming cap, with which he started the engine until the cylinder and the surrounding metal were sufficiently warm to vaporise the hydrocarbon and cause a succession of explosions at the right moment. The explosions of an explosive engine can well be likened to a series of hammer blows, and a heavy flywheel was necessary to take up the force produced and to give more or less regular motion. Later on, about 1898, the form of ignition began to change, and an electric spark was used to ignite the charge, the spark being timed by a contact-breaker in which metal pieces alternated with fibre or vulcanite. By the alteration of the position of these, the spark was made to occur at different periods, either early or late, during the stroke of the piston. The inherent disadvantage of the Otto cycle may best be described by saying that only one movement in four of the piston is power-producing. To describe the cycle, first of all we will assume that the explosion has just taken place in the cylinder, driving the piston down to its lowest point. Immediately this point is reached, the exhaust valve operated by the cam shaft opens, and the exhaust gases escape into the open air during the time when the piston is rising from its lowest to the highest point; on this being reached, the exhaust valve is closed automatically, and the downward or suction stroke begins. The mixture, as it is called—that is, the charge of fresh air mixed with hydrocarbon vapours—is drawn in through a valve which up till lately was opened owing to the vacuum created by the downward stroke of the piston. Nowadays, however, both inlet and exhaust valves are operated by rods worked from the cam shaft. The piston thus having reached the lowest point, and the cylinder now being filled with hydrocarbon vapours, and all valves being closed, the piston begins to rise again, and compresses the vapours till the maximum of compression is reached, when the piston is once more at its highest point. It is then that the explosion is made to take place either by means of the ignition tube as formerly, or by an electric spark from the sparking plug, as in modern practice. The explosion thus created develops a pressure of anything between 200 and 400 lb. on the square inch, according to the previous compression and the richness of the gas, and the piston is again driven down to its lowest point, when the cycle, as mentioned in action No. 1, begins over again. The inherent disadvantage of the Otto cycle, as will be observed, is that out of every four movements of the piston only one is a stroke which produces power. This peculiarity necessitates the use of at least four cylinders before an even torque can be obtained. It will thus be seen that the use of a comparatively heavy flywheel is essential if any steadiness in running is to be obtained in an engine with less than four cylinders, or if the crank shaft is to revolve at any moderate speed. In the early engines, the cylinders were cooled by water-jackets placed around the cylinders, and others were air-cooled, having flanges made on the outside of the cylinder walls, and on the inlet and exhaust pockets, in order to enable the heat to radiate freely into the outer atmosphere. It should be mentioned that the temperature developed at the moment of explosion is probably not less than 2,500° Fahr., and it will thus readily be seen what a great amount of superfluous heat has to be got rid of in order to prevent the working parts becoming dangerously hot and seizing, and thus stopping the engine. It may also be mentioned, as showing how comparatively little effect air without a fan has even at its coldest temperature on the heat produced in non-water-cooled cylinders, that Sir Ernest Shackleton found in the car which he used on his recent South Polar expedition, fitted with a fanless air-cooled engine, that even at a temperature of 30° below zero—that is, 62° of frost—the engine became uncomfortably hot, except when the vehicle was running against a strong wind. In the case of water-cooled engines, the general system adopted is that of a radiator consisting of some kind of gilled tubes running vertically or horizontally in a frame fixed in front of the engine. The water is made to flow through these by means of a circulating pump working off the cam shaft or crank shaft, and thus the water is kept moving and never allowed to reach the boiling point. By some experiments conducted by Mr. S. F. Edge in 1908, it was ascertained that the best results are given by an explosive engine when the temperature of the water in the cylinder-jacket is not less than 140° Fahr., and does not exceed 180°. Below 140°, and above 180°, the engine was proved to lose power. The scientific reason for this has not yet been really well established, and it is not known whether it is due in the case of the higher temperature to the expansion of metal making certain moving parts do their duty with more difficulty and less efficiency, or whether at the lower temperature the loss of heat through the cylinder walls diminishes the force of the explosion. But these two explanations are given as being those most commonly accepted. As regards the design of the remaining parts of the explosive engine, the crank shaft and base or crank chamber does not differ from those in use in steam practice, excepting that the base chamber is virtually airtight, as many motor engines depend to a certain extent upon splash lubrication—that is, from the splashes of oil into which the end of the crank pin dips at every revolution. In the newer forms of engine, however, the crank chamber is practically dry, and the oil which circulates is collected in a sump below, and pumped by an automatic pump through all the working parts. This system is, of course, infinitely preferable to the somewhat crude system of oil splashing, and where it is adopted the offensive blue smoke noticeable behind some makes of motor-cars can never take place, and there is also an absence of the disagreeable smell as well from the parts which, under the older system, get over or not sufficiently lubricated.



An English 15 h.p. Chassis. A Daimler Car fitted with the Silent Knight Engine.

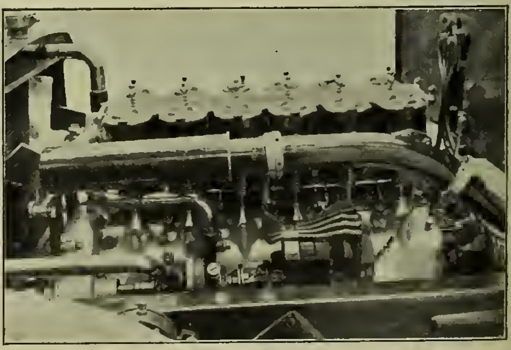
Car Gear.—Behind the cylinders and crank chamber, towards the rear of the vehicle, is generally placed the flywheel, weighing anything between 40 to 100 lb. Attached to the back of this is usually placed the clutch or mechanism whereby the engine is engaged or disengaged from the gear, and by which, therefore, it is possible by the action of the foot pedal to prevent the propelling machinery from acting. The gear-case is placed behind this again, generally about the middle of the chassis, and in modern practice the shaft continues, in the case of cars possessing a direct drive, right away to the bevel on the hind and propelling axle. In cases where the transmission is by means of chains, the gear-box contains the bevel-gear in connection with the counter-shaft, which operates the sprockets outside the chassis. Over these sprockets the chains run to another set of cogs fitted upon the hind wheels. During the last few years the cardan shaft system—that is, the system in which the live axle and cardan shaft is used, has gained much upon the other system of chain transmission, and probably in a few years, except for heavy vehicles, chain transmission will be a thing of the past. The number of gears vary from two or three in the case of small cars, to four or even five in the case of bigger and more powerful machines. Take a 30-h.p. car as the type of a car much used; the first speed will probably give at a thousand revolutions of the engine per minute about 8 miles per hour, the second speed about 16, the third 24, and the fourth about 32. Where a more powerful engine is employed, the variation may run more or less as follows: 10, 25, 40, 60. In cars where three speeds are employed it is usual to graduate the highest and intermediate speed more nearly together, rather than the lowest and intermediate. To give an example, the first speed in a small-powered car is, say, 5 miles per hour, the second speed may be 15, and the third 20 to 24. It is found in practice that this is more convenient in the case of small-powered cars, as it enables the gradients of an ordinary road to be overcome without using the lowest speed, unless an unusually steep hill is encountered. A diagram is given of a typical chassis, from which the above explanation of the mechanism of propulsion will be more readily understood.

Brakes.—Another important point of the mechanism of motor-cars is the design and practice adopted with regard to brakes. So important were efficient brakes felt to be that even in the early days of the development the Local Government Board regulations stipulated that at least two efficient brakes should be provided, each capable of stopping the car independently of the other, and acting equally well in a forward and backward direction. In addition to this, it is a common practice with drivers, who drive with their brains alert, to utilise the resistance of compression in the engine when long downhill gradients have to be negotiated. The use of the resistance of compression in the case of long descents in mountainous countries, such as in the Alps or Pyrenees, is almost essential, for when the road descends for a distance of 10 miles or more, parts of which may exceed 1 in 10 in steepness, there are no brakes which can be made, which, even if they are water-cooled, will not practically get so hot as to lose their efficiency and involve the risk of trouble. The usual practice now in regard to brakes is to have two internal expanding brakes on drums on the hind or driving wheels. There are practical inventions on the market also by which the front wheels can also be braked. These brakes are usually worked by means of a hand-lever placed in such a position that the driver can easily operate them. The pedal, which, as a rule, is on the right-hand side of the clutch-pedal looking forward, generally operates the foot-brake, which is a circular band of soft or cast-iron surrounding a metal drum upon the cardan shaft, counter-shaft, or crank-shaft as the case may be.

Double-acting Cylinders.—In discussing motor-engines it should be mentioned that probably there are many inventions in the direction of double-acting cylinders which will before long supersede those designed on the principle of the Otto cycle as it is at present understood. Already in marine work there are several excellent double-acting cylinders in operation, and the only objection to their application to cars has hitherto been that they are somewhat more cumbersome and seem unable to withstand the continuous vibration which road travelling involves. In addition, too, there is the fact that more water is needed for cooling, and, therefore, more weight has to be carried, an inherent disadvantage for which there seems, so far, no remedy. The tendency to failure is also in this present stage of development greater. But that a two-cycle engine will eventually displace the Otto cycle engine can hardly be doubted.

Valveless Engines.—In the summer of 1908 the Daimler Co., of Coventry, adopted, after a great many careful experiments, Mr. Charles Knight's valveless engine. The term valveless is perhaps hardly correct, for instead of the mushroom-shaped valves usually employed, fitted as they are with springs, and operated from the cam shaft by means of upright rods or rocking levers, Mr. Knight adopted two sliding sleeves fitted with ports, which were arranged to open and shut at the right moment to admit the explosive gases or to allow the exhaust to escape. Writing in August, 1909, it may be said that Mr. Knight and the Daimler Co. have plainly proved their claim to have this engine reckoned as one of the most useful and interesting developments in the internal combustion engine, and, after a successful running on the road of some thousands of these cars, it has been proved that they are as practical as they are efficient and silent.

Six-cylinder Engines.—It should also not be forgotten that from 1905 onwards several makers of first-class importance adopted, especially in their larger types of engines, the six-cylinder principle, thereby securing a wonderfully smooth-running and silent motor, resulting in better balance and a constant torque upon the cardan shaft. The two best-known makers of the six-cylinder engines have both of them produced a motor of such silence and flexibility that it is certainly equal, if not superior, to the steam engine. Not only has it these admitted advantages,


A FRENCH SIX-CYLINDER ENGINE.

but, what is more important, the wear and tear upon the tyres and gears is proved to be infinitely less where the torque is even than in the case where the power is produced by a series of four instead of six hammer-like blows. This quality of smoothness in running and great flexibility undoubtedly cheapens the cost from the tyre point of view, which, after all, is the most important item in view of the expense of running a motor-car, and the extra cost of such an engine is to some extent, if not fully, recouped by this quality which it possesses.

Carburettors.—Amongst recent inventions which seem to be leading to still further improvements may be mentioned the water-jacketed carburettor, thereby producing a more easy carburation of the hydrocarbon, and making it possible to use petroleum spirit of much higher gravity than was originally found possible. In old days surface carburettors, as they were called, were the rule, and the specific gravity of petroleum spirit or petrol, as it is commonly called, could not generally exceed with convenience .680. In the early jet carburettor, in which a small jet of spirit was directed against a mushroom-like piece of metal, and sprayed against the incoming air, even petrol of a specific gravity of .700 and .720 was thought to be as heavy as could possibly be used with advantage. Nowadays, however, a specific gravity of .760 to .780 is common enough, and owing to the provisions of the Budget of 1909 fixing a duty on all petrol below .800, it is probable that before long the motor-car spirit used will be heavier than this. The increase also in the number of carburettors especially designed to vaporise petroleum perfectly which varies from .800 to .900, and benzol, a tar spirit, from .820 to .900, and other hydrocarbons, which are upwards of .800 specific gravity, will do much in this direction.

Tyres.—No account of a modern motor-car would be quite complete without some brief description of the pneumatic tyre, which has been so largely instrumental in making for smooth running, absence of noise, and smoothness of motion. It is generally known how John Dunlop in the early days conceived the idea of inflating a tube made of indiarubber inside a cover made of coarser and stouter rubber material, strengthened by layers of canvas, the covers being secured to the rim of the wheel by flanges which fitted into grooves specially designed for them. The pressure of the air in the tube kept these flanges tight under every condition, and though safety-bolts were used in some cases and for the purpose of attaching and detaching the tyre, it has been proved that without any safety-bolts at all a tyre will remain on so long as it is fully inflated with perfect safety within the rim of a properly flanged wheel. Many other makers at home and abroad have now adopted this principle, the master patent of which expired in 1905. Originally motor-car tyres were made in quite small sizes, a tyre of 3 ins. from the outside of the tread to the inner part of the rim being thought quite a big tyre, but gradually the size increased as the weight and power of motor-cars also increased, and to-day, on the largest and most powerful cars, a 7-in. tyre is used (175 millimetres), while the standard sizes have now settled themselves down to 65, 90, 105, 120, and 135 millimetres measured from tread to inner side. The rubber and material used in the manufacture of these tyres is much better than it used to be, and it is not an uncommon thing now for a tyre fitted to a light car to run upwards of 5,000 miles before it needs retreading, and in some cases of the larger size, when proper care is exercised, the writer has known instances where tyres have run 8,000 to 9,000 and even 10,000 miles without causing any trouble, and then as retreaded tyres, have run yet another 2,000 or 3,000 miles further.

THE TYRES SPECIALLY DESIGNED FOR THE FIRST MOTOR CAR TAKEN ON A POLAR EXPEDITION.

(From *The Heart of the Antarctic*, by Sir Ernest Shackleton, C.V.O.)

Cost, &c.—But, notwithstanding the great improvement in tyre manufacture, there is no doubt that tyres still constitute the greatest expense with regard to the running of a motor-car. Petrol can be calculated as varying from ¼*d.* to 1*d.* per mile; oil, grease, carbide, &c., from $\frac{1}{10}$th to $\frac{1}{20}$th of a penny, while tyres on the other hand vary from 1*d.* to as high as 6*d.* in the case where a car is heavily loaded, high engine-power is used, and the driving is fast and over bad roads with loose and sharp metal. A table is here given to show the comparative cost of running of various makes of cars. The figures are taken from practical experience during the years 1906 and 1907:—

EXAMPLES OF RUNNING COST COMPILED FROM ACTUAL EXPERIENCES.

Car and H.P.	8 h.p. Single-cylinder.	10 h.p. Four Cylinders.	15 h.p. Four Cylinders.	24 h.p. Four Cylinders.	24 h.p. Four Cylinders.	36 b.h.p. Four Cylinders.
Body...	Two-seated.	Tonneau. 4 seats.	Landaulette (doctor).	Side entrance. 5 seats.	Landaulette.	Landaulette (doctor).
Weight	9 cwt.	18 cwt.	23 cwt.	30 cwt.	37 cwt.	40 cwt.
Country or town use	Country.	Both.	Town.	Country.	Country.	Both.
By whom driven	Private Owner.	Paid driver.	Paid driver.	Private Owner.	Paid driver.	Paid driver.
Mechanism looked after by owner or driver	Owner.	Driver.	Driver.	Owner.	Owner.	Driver.
Annual mileage	7,000	6.000	9,000	5.000	5,000	10,000
Transmission	Live axle.	Chains.	Live axle.	Chains.	Chains.	Chains.
Clutch	Metal.	Leather.	Leather.	Metal.	Leather.	Leather.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Petrol, grease, oil, carbide, &c.	18 15 0	17 16 3	52 18 1	38 16 9	27 4 2	67 15 5
Rent	Own stables.	Own stables.	21 16 2	Own stables.	Own stables.	50 0 0
Repairs	Done at home.	Done at home.	10 14 8	Done at home.	Done at home.	Done at home.
Spare parts and renewals ...	1 8 0	2 14 7	3 12 8	None.	1 17 8	6 12 1
Tyres	12 14 6	23 6 4	25 8 2	36 15 6	38 18 9	105 16 4
Driver's wages..	None.	71 10 0	89 2 0	None.	70 6 8	122 4 10
Licences, taxes, club subscription, &c.	11 15 0	5 10 0	6 2 0	13 14 0	6 8 0	5 6 0
Sundries	1 17 4	1 16 0	1 0 3	5 11 7	1 18 6	5 9 7
Insurance	7 10 0	10 0 0	21 5 0	18 0 0	18 0 0	19 0 0
Total	53 19 10	132 13 2	231 19 0	112 17 10	164 13 9	382 4 3
Cost per mile	1·8*d.*	5·3*d.*	6·1*d.*	5·4*d.*	7·9*d.*	9·1*d.*
Original price of car	210 0 0	700 0 0	450 0 0	905 0 0	950 0 0	1,000 0 0
Depreciation :— 1st year one-third of value. 2nd year 25 per cent. of value. 3rd year and after 15 per cent. of value.	1 year old, 70 0 0	4 years old, 523 6 8	1 year old, 150 0 0	1 year old, 301 13 4	3 years old, 693 13 4	1 year old, 333 6 8
Present value of car	140 0 0	176 13 4	300 0 0	603 6 8	256 6 8	666 13 4

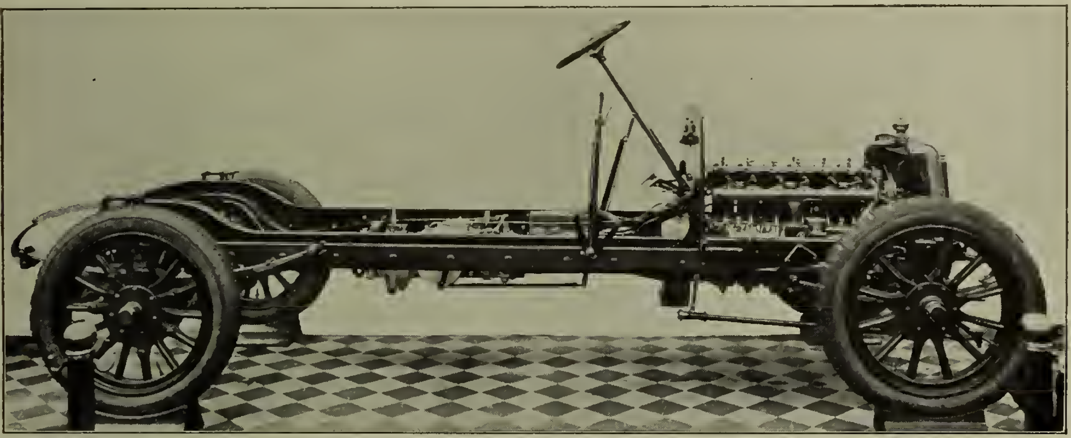
These figures, if anything, err on the side of extravagance, and lower running costs are really possible in practice, especially in regard to the last four columns. It should also be remembered that per miles run, if many miles are run, the motor-car is cheaper than horse traction, which averages from 9*d.* to 1*s.* a mile.

The Modern Motor: *Introductory.*—If some comparisons are odious, others are impossible. I do not, therefore, attempt to compare the work of the inventor and the engineer in connection with the mechanically propelled road vehicle, with their work in other spheres. Not because the comparison would be odious (all such work has contributed to the advancement of learning and the service of civilisation), but because it is impossible. The record of that work contains many golden entries of triumphant achievement. Let it suffice that among the first of these the motor-car stands up.

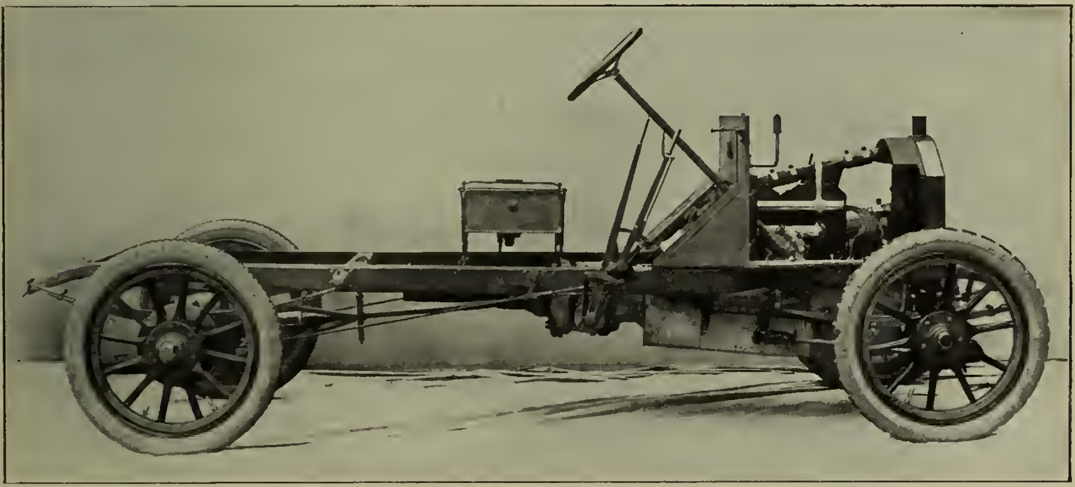
The history of the development of the motor-vehicle, principally as expressed through public tests, and trials, and sporting contests, has been sufficiently set out elsewhere in this book. Nor is there need, even if the thing were practicable, to treat of the story of struggle and disappointment that almost inevitably accompanies early efforts to bring an idea to concrete expression. The inventor who has not been obliged to eat to surfeit of the bread of bitterness before his work came to fruition may account himself a fortunate fellow indeed. Normally, the condition is very much reversed. It is only necessary to our present purpose to note that serious progress with the motor-vehicle did not commence until the advent of the internal combustion engine. The history of that progress is covered by a period well within the life of the young man whose majority is to seek, and yet, so far as England is concerned, the motor-vehicle is clearing the streets of large towns of horsed traffic, it is one of the commonest objects of the countryside, and its utility, not only in private and public service work, but in commerce, is established beyond cavil. The same motive power is functioning to good purpose on the water, and it has to-day at least opened the wonderful possibility of aerial domination by human kind.

A Page of Wonder.—What applies to England in this connection applies in varying degrees to most other civilised countries. But not these only. The spots on the earth's crust possible to any vehicle, which have not been touched by the motor-car, are growing smaller by degrees and beautifully less. A car accompanied the Shackleton Antarctic Expedition, and penetrated furthest south. Scarfoglio went round the world on a car. Prince Borghese adventured from Pekin to Paris through trackless wastes. Africa has been laid under tribute, and China, and Russia, and other lands of seeming impossibility. The car has taken passengers up mountain sides that no horsed vehicle could touch. It has travelled at over two miles a minute, and it can crawl through congested areas at two miles an hour.

For so brief a life, the results are amazing. Almost, it would seem *now* that



A French Six-cylinder 35 h.p. Panhard Chassis.



The New 15 h.p. Four-cylinder Noiseless Napier.

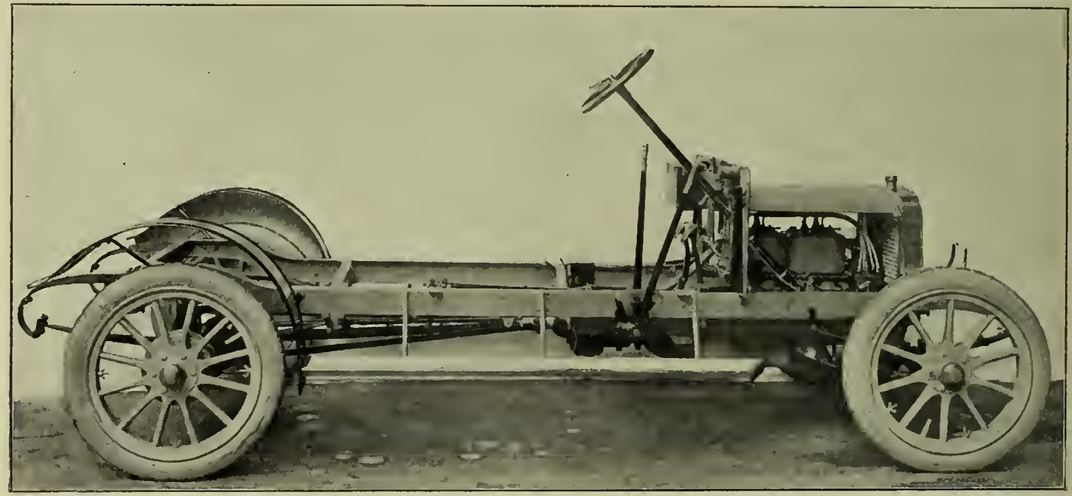
the world awaited the coming of the car, and hailed the advent gladly. That is not how it appealed to the motoring pioneer, I fear. He had much prejudice to overcome, and much "frigid and calculated"—opposition! And some of it remains even to this last. But, considered historically, the extraordinary rapidity of the development constitutes a wonder page in mechanical evolution.

With that, however, we are not here to be concerned. Ours is the unornamental and merely useful task of endeavouring to explain something of the internal economy of the car, to lay bare the engine, the clutch, the gear-box, the propeller or cardan shaft, the differential mechanism on the live axle, through which the power generated in the engine is finally transmitted to the road wheels, and so on. In short, we have to explain just why it is the wheels go round, and to do it, so far as possible, in language easily understood of the non-technical reader who is yet interested in discovering the underlying reasons of the movement of the car, and how it comes about that a man, sitting in the driver's seat, can, by depressing a pedal or moving a lever on the steering wheel, shoot away from the gait of a crawling horse cab to the speed of an express railway locomotive.

The Problem.—The explanation is not so simple as it looks. It would be plain sailing enough if the reader happened to be familiar with the terminology of the technical person. He is not; and the difficulty is that technical terms are the only forms of expression open to me very often. I have, however, appended a glossary of such terms, and would ask those readers who have any difficulty in following the functions of a differential or a clutch, or a magneto, or a carburettor, to keep that glossary before them. The purpose of each piece of mechanism will, of course, be explained as we go along, but for ready reference consult the glossary.

Now, broadly speaking, and without going into unnecessary detail, we can divide self-propelled road vehicles into four classes, according to the type of motive power or power plant to which they owe their motion. Thus:—

(*a*) Internal combustion (petrol engine).
(*b*) Steam engine.
(*c*) Electric accumulator and dynamo.
(*d*) Petrol engine with dynamo and electric motor.



THE 12 H.P. ADLER CHASSIS.

The last two systems are not of great interest. Whatever the future may have in store for them, they have no general adoption to-day, and may be left out of the present reckoning. The steam engine calls for more attention, and as a reference to its principal characteristic will be helpful in the analysis of the petrol, internal combustion, car (which must claim chief consideration), I will make brief commentary here.

Steam Car Characteristics.—The steam car possesses a steam generating plant (the boiler, &c.), and, in sequence, an engine and driving shaft connected with the back axle. A burner below the boiler heats the water until steam is generated. The steam is transferred to the cylinder by a simple mechanism, the volume being controlled by a throttle or admission valve. The pressure of the steam on the piston in the cylinder forces it down or up. The piston is connected with a crank shaft, which is revolved as the piston rises and falls. The crank shaft is attached to the driving shaft, which transmits the power to the back wheels through the back axle, and—the vehicle moves.

That is, in a word, the order followed. The point to be emphasised here, however, is that, at whatever speed the engine is turning—that is, at whatever speed the piston is travelling up and down in the cylinder, whether it be one, two, three, or a thousand or more revolutions a minute, the engine is developing or giving off its full power. This is because the elasticity of the steam permits of the pressure generated in the boiler re-acting effectively and steadily on the piston through a wide range of speeds. The pressure can be kept constant, whether the admission valve be half closed or wide open, be the car speeding fast along the open road or labouring up the hill. That is the main reason why the "steamer" has managed to maintain a fair popularity. It can develop the full power when most necessary, *i.e.*, at low speeds. Consequently, it needs no gear-box, can dispense with such accessory fittings as clutches, side levers, and gears, and the engine cannot very well be stopped at the wrong moment by any lack of skill on the part of the driver. This reference, although so very brief, will assist in making clear the particular difference between the steam and the petrol car, and will show where the latter fails by comparison.

The Petrol Car: A Comparison.—The power of the petrol car is derived from an engine which is rotated by the force of a series of explosions within the cylinder at intermittent periods. Such explosions, to be effective, have to be sharp and sudden, and, therefore, fall off in power and value as the speed of the engine decreases. The reason lies in the fact that an explosion is actually no more than the rapid burning of an inflammable gas. If it does not burn rapidly—that is, if the explosions in the cylinder do not follow one another quickly enough—the engine will lose power.

This is particularly noticeable when the car is trying to climb a hill. As the steepness of the hill increases, the load or the weight of the car tends to pull the engine up or slow it, with a concomitant falling off in power at the very time when it is most needed. It is in this characteristic that the petrol car compares badly with the steam car, and makes it necessary to provide a clutch and gear-box whereby the engine revolutions are multiplied progressively according to the number of change-speed ratios employed. Changing gear, however, while it keeps the engine revolutions more constant and maintains power, means a sacrifice of car speed. It means that, although the explosions in the cylinder are kept rapid and the engine is turning at its best speed, the interposition of gear wheels has reduced the speed of the driving shaft that actually moves the car's road wheels.

And now we may proceed to analyse the petrol car under four heads: (1) Engine. (2) Transmission gear. (3) Under-frame or chassis. (4) Body. I propose to take these in turn and describe each of them with requisite minuteness, looking closely into detail, and discovering the *raison d'être* of the parts themselves.

Part I: Petrol Engine.—As a six-, four-, two-, or single-cylindered engine works on the same principle, it will be easier if we take this latter type as the subject under review. It will be seen from the illustration (Fig. 1) that the engine includes a cylinder (*A*), within which the piston (*B*) moves, vertically, up and down. The piston is joined by the connecting rod (*C*) to the crank shaft (*D*). On the end of the crank shaft is a gear wheel (*E*), which meshes the two other wheels (*F F′*). These are mounted on the two shafts (*G* and *G′*). which possess cams or eccentrics (*H H′*). The function of the cams, when they are rotated by the engine shaft, is to lift, alternately, the inlet valve (*I*) and each exhaust valve (*I′*). A further reference to the parts of the engine shows us the vaporiser or carburettor (*J*), exhaust pipe (*K*), magneto (*O*), sparking plug (*P*), and water pipe (*L*).

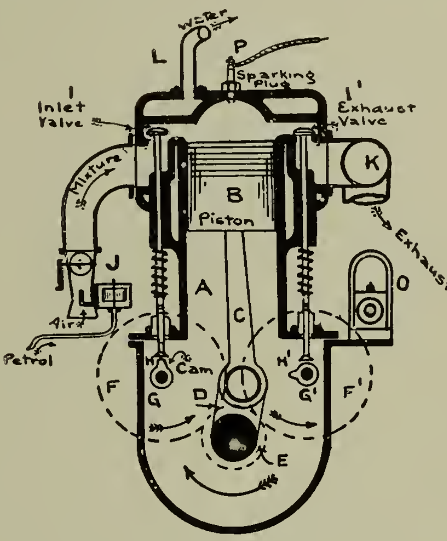


Fig. 1.—Single Cylinder Engine.

There is nothing much more tiring to

the untrained eye than a lettered drawing of a fairly intricate piece of machinery. At the same time there is no better way available to bring the parts of the mechanism clearly under notice. I think in this case the purposes of the parts will be fairly obvious if the diagram is referred to as the parts come under consideration.

Functions.—Before the engine will work, it must have fuel. The fuel used almost exclusively is a spirit distilled from petroleum and called petrol. Benzol, alcohol, and ordinary paraffin are sometimes used, but a special carburettor is required in the case of the last two fuels, and the results secured from benzol are not uniformly satisfactory. As they are so little used, we need not consider them here. Petrol is our fuel. It vaporises easily, and, mixed with air in correct proportions (about 18 parts air and 1 part spirit), it forms a highly explosive "mixture." This "mixture" is made in the carburettor to be described later.

To follow the work taking place in the cylinder of the engine, it must be assumed that the tap between the petrol tank and the carburettor is open, and the electric switch is "on." Petrol flows from the tank to the carburettor, is mixed with air, and is then ready to be sucked into the cylinder. The cycle of operations follows.

The piston (as shown in sketch) is at the top of its stroke, and the inlet valve (*I*) is open, pushed up by the cam (*H*). The exhaust valve meanwhile remains closed. Revolve the crank shaft in the direction of the arrow, and the piston descends, sucking in a charge of vapour from the carburettor. By the time the piston has reached the bottom (approximately) of its stroke, the cam on the cam shaft has turned and released the spring of the inlet valve. The valve, therefore, closes, and the piston, uprising, compresses the charge imprisoned in the cylinder. When the top of this up-stroke is reached, a spark, generated by the magneto, occurs at the sparking plug (*P*). This spark explodes the charge of compressed gas, and the expansion of the gas resulting from the explosion forces the piston downwards.

Now, as the piston nears the end of this down stroke, the cam (*H'*) rises and lifts the exhaust valve off its seat, keeping it open while the piston, once more rising, ejects the spent gases out through the exhaust pipe (*K*). By the time the piston reaches the top of the stroke, the cylinder is cleared of the exploded charge, the exhaust valve released by the cam closes, the inlet valve opens, and the process is repeated. This succinctly describes the functions which are expected to follow one another in very rapid succession—800 to 1,500 times a minute, perhaps.

A recapitulation shows us:—

(1st) *Down stroke.* Inlet valve open. Exhaust valve closed. Piston descends, sucking.

(2nd) *Up stroke.* Both valves closed. Piston ascends, compressing.

Spark Occurs.

(3rd) *Down stroke.* Both valves closed. Piston forced down by explosion.

(4th) *Up stroke.* Exhaust valve open. Inlet valve closed. Piston ascends, expelling burnt gases.

This is defined as the "Four Cycle" principle, and applies to nearly every engine in motor-car service to-day. We see from this that the stroke immediately following the explosion is the only power stroke in the cycle. We see that both valves are closed alternately for, altogether, one and a half, and open for only one-half, revolution (approximately). The speed of the cam shafts operating the valves must, therefore, be half that of the main crank shaft, because each valve only opens *once* (one revolution of the *cam* shaft), while the piston falls and rises *twice* (which means two revolutions of the *crank* shaft). That is the reason why the "timing" wheels (*F* and *F'*) on the cam shaft, which mesh with the wheel (*E*) on the main crank shaft, are called the "half-time gear." I hope we are clear so far.

One other important point on the general principle of the petrol engine before we proceed to consider its details. As the "power" stroke only occurs once in four (two down and two up), some means must be devised to carry the piston over its other three strokes evenly. The flywheel is the means. Not only does the momentum imparted to the flywheel by the power stroke carry the piston up, down, and up again, but much of the shock which the explosion in the cylinder causes, and which, otherwise, would be distributed over the rest of the car is absorbed. Without the flywheel a single-cylindered engine particularly, would waste so much of the power generated by the explosion that the piston could never finish its cycle of operations at all.

Valves.—Now for detail. The illustration shows clearly how the valves are arranged. This mushroom-headed valve is the most common type, and in practice gives little trouble. It is held firmly to its seating by the spring coiled round and attached to its stem. The spring ensures the valve shutting positively and quickly as soon as the cam descends. Between the valve stem and the cam a "tappit" translates the motions of the latter to the former. To insert the valve, and for the sake of accessibility, a screw cap is provided in the "pocket" above the valve.

Sparking Plug.—This is usually located above the inlet valve, or directly over the piston. It consists of a central metal stem, terminating in a point at its lower end, and insulated, by porcelain or mica, from the body which screws into the cylinder. The current (from the magneto or coil) is conducted on to the central stem down which it travels, and, jumping the small air-gap between the bottom point and the body, creates the exploding spark.

Carburettor.—It is remarkable that this, the very lungs and heart of the car, should to-day be one of the least perfect of its parts. To the novice it is often a sphinx-like puzzle. It calls for a full consideration, therefore.

A carburettor (see Fig. 2) usually consists of two compartments: (1) the float chamber, and (2) the mixing chamber. The former is cylindrical, and, at the bottom, is connected by a tube to the petrol tank. Where the petrol enters the float chamber is a seating on to which a "needle" valve closes. Surrounding the needle, but separated from it, is the float. If the chamber is empty, and the float has nothing to float on, it of course descends. As it does so a simple lever lifts the needle out of the valve and the petrol flows in. The float rises with the petrol until it reaches the requisite level, when the needle shuts down on its seating and stops the inflow.

From the float chamber the petrol flows into the jet which is centrally located in an air-pipe. The level of the jet is slightly above that of the petrol in the float chamber, so that none can overflow. Above the jet, in the induction (air) pipe which leads to the engine, is the throttle valve, the function of which is to regulate the amount of mixed air and petrol upon which the speed of the engine depends.

The Carburettor in Action.—To explain the action of the carburettor, imagine the engine in motion. (The carburettor, of course, stops operating when the engine stops.) In the cycle of operations in the cylinder we saw that at every second down stroke of the piston the inlet valve is opened. The descending piston produces a suction on the air in the induction pipe. This creates a slight vacuum in the air space round the jet, and causes a modicum of petrol to squirt out. The size of the jet is so small that the petrol is broken up into particles which immediately vaporise and mix with the air which is being sucked up into the cylinder. The "mixture" is then duly compressed and exploded.

Now, the level of petrol at the jet must be kept practically constant. Otherwise a sufficient quantity will not be sucked up when the inlet valve opens again. Our needle valve in the float chamber provides the solution. A certain quantity of fuel having been drawn from out of the float chamber, the float descends automatically, opens the valve, and admits a further quantity of petrol, sufficient to restore the level at the jet.

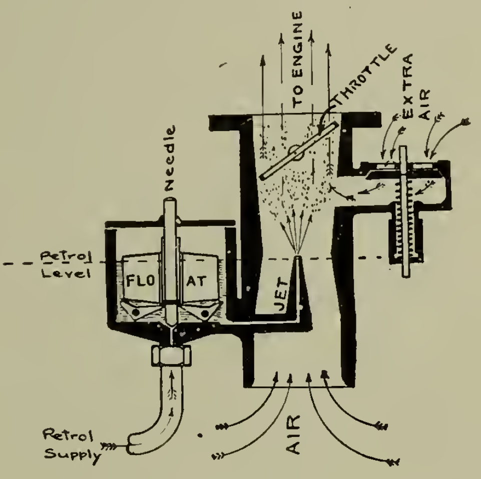


FIG. 2.—CARBURETTOR.

All that is simple enough, but with the engine working at high speed, we meet with problems. The speed of the engine increases the vacuum in the air pipe, and after a certain point this gets so great that the air becomes attenuated, with a result that the proportion of petrol used is greater than it should be. Too rich a mixture not only spells waste, but trouble. First, it is not so powerful an explosive; and second, it tends to overheat the engine. Therefore, in many carburettors, an extra spring-closed air valve, which opens in proportion to the increased suck of the piston, is fitted. "Extra air valve" is, of course, a misnomer, since an engine does not require more air at high speeds, but only as much, proportionately, as at low speeds. We have to pardon misnomers of this sort very often.

The essentials of the carburettor are, therefore: (1) that it should embody means for providing a proper supply of fuel; (2) that it should deliver this as required by each stroke; (3) that the quality of the mixture should not vary. The latter is the stumbling block. The theoretically correct proportion is almost impossible of attainment, because a liquid (petrol) and a gas (air) will not obey the same physical laws. The carburettor designer has to get as near the ideal as he can, taking into consideration the wide range of the car's speeds and loads. The nearer he gets, the greater the power developed per gallon of petrol.

Ignition.—So much for the carburettor. Now with regard to the magneto. The engine illustrated has been designed with magneto ignition—by far the most common form. Two systems of magneto ignition are made, "low tension" and "high tension." The former is rapidly losing favour, not because of any inherent defect, so much as because of the great improvement in the high tension—not because we love low tension the less, but because we love high tension the more!

A low-tension magneto is merely an electricity generator. It consists of ∩-shaped hard steel "permanent" magnets, between the lower "poles" of which an "armature" is revolved by a suitable driving gear. What is an armature? A central spindle on which is built up a series of soft iron discs, which, in turn, are encircled with a winding of insulated copper wire. One end of this wire is "earthed" (*i.e.*, joined) to the spindle itself, and the other to a collector ring, from which a contact "brush," as it is called, leads the generated current to the sparking plug.

Now this plug is of a totally different type from that used for the high-tension ignition. It consists of a mica insulated metal cover, on to which the magneto wire is joined. Inside the cylinder, and in contact with the metal core of the plug, is the end of a rocker arm, which passes out through a gas-tight gland in the cylinder wall, and is connected to a tappit rod, which extends down into contact with a cam on the "half time" shaft. When the engine revolves, the magneto armature is rotated and generates a current, which passes through the plug and rocker arm. As the "half-time" shaft is also in motion, the cam, at the proper moment, lifts the tappit rod and breaks the contact between the rocker arm and the plug in the cylinder. As contact is broken, the spark occurs.

The main drawback to this system of ignition is the difficulty of maintaining a gas-tight joint at the gland where the rocker is introduced through the cylinder wall.

The high-tension magneto eliminates this defect. It is somewhat similar externally, having a magnet and a rotating armature. The armature, however, in this type has two sets of wire coils. One of these (the low-tension coil) is joined in circuit with the mechanical "contact breaker," situated at one end of the armature. The other (the high-tension coil) leads out through the carbon "brush" collector to the sparking-plug. If the engine be set in motion, the armature revolves, and generates a current in the low-tension coil. The instant contact is broken, the re-active effect causes a "sympathetic" high-tension current to surge through the secondary winding (the second wire coil), and a spark occurs at the plug.

All that makes for hard reading to the compleat tyro, doubtless, but as I pointed out at the commencement, the language of simplicity or familiarity is often impossible in dealing with such subjects. Moreover, some of the questions likely to arise in connection with electrical subjects simply cannot be answered. We do not know why a sympathetic current is generated in the high-tension coil when contact is broken on the low-tension circuit. We only know it *is,* and must leave it at that.

One other point here. It is, of course, necessary that the low-tension circuit should be led through to the switch on the dashboard in front of the driver, so that when he wants to stop the engine he can switch off the current. Again it is vital that the relative positions of the engine timing gear, and the magneto contact breaking should be correct. Otherwise we would have the spark occurring at the wrong moment. Obviously, with an engine turning at 1,000 revolutions a minute, the moment at which the spark occurs must be earlier than when the engine is only turning at 300 revolutions a minute. If this were not provided for, the piston, moving at a very high speed, would be well on its way down the cylinder before the explosion took place, and much power would be lost. On the other hand, if the spark were set for high speeds and the engine revolutions were reduced from 1,000 revolutions to 300, the spark would be occurring too early, and back-fires and all manner of mischief would result. Therefore, a hand operated-lever for varying the timing of the spark (*i.e.*, the moment at which contact is broken) is usually provided on the steering wheel, or some other convenient position.

The modern high-tension magneto is wonderfully reliable, and, except for a very occasional drop of lubricating oil, requires little attention.

Lubricating System.—The carburettor was referred to as the lungs and heart of the engine. Pursue the metaphor and the lubricating system is the blood of it. And the blood is the life. Machinery without oil is like life without liquid. Wipe out lubricants, and we make a mechanical cast back to the Stone Age or thereabouts.

To describe in detail every system of lubricating an engine would require a very large book. It is sufficient to say that the simplest is just a supply of oil which can gravitate through pipes to the necessary bearings, with a reservoir of oil in the crank case, into which the revolving engine crank plunges and so splashes the oil up and over the cylinder walls and the ends of the connecting rod. As alternative to this (the gravity feed system) we have (1) mechanical pump, driven by the engine; (2) hand pump; (3) exhaust gas pressure on the top of the oil in the (sealed) tank; (4) pressure on the oil by means of the circulating water. Every car manufacturer has his own particular fancy, and, with ordinary care, any of the systems will give good results. It is important to use an oil of a viscosity suited to the type of engine employed. The maker's directions are generally good enough to prevent mistakes being made here.

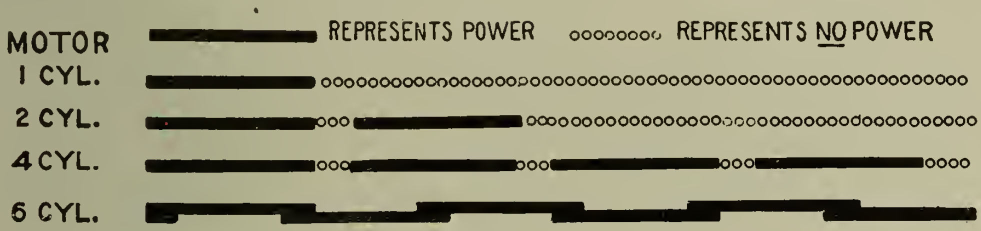


FIG. 3.

Engine Cooling.—As the petrol motor is a "heat engine," it is necessary to provide means for dissipating the accumulating heat generated by the explosions inside the cylinder. There are two ways in which this can be done: by air or by water radiation. The former is in general use on motor cycles, and is exemplified also on a few American cars. But the usual and most efficient method is by water. Water cooling is effected, broadly speaking, in two ways:—

(1) Pump circulation.

(2) Thermo-syhpon.

And this is how it is done. Refer again for a moment to the sketch of the engine. A space is provided in the cylinder casting through which a stream of water is maintained. The water passes up through the pipe (*L*) into the radiator, generally in front of the car, but sometimes on the front of the dashboard. Here the natural air-draught (supplemented by a fan) cools the water, which then descends to the bottom, passes through the pump, and re-enters the cylinder water-jacket. That is pump circulation.

The thermo-syphon cooling system dispenses with the pump, and depends on an "induced" circulation which naturally tends to occur through the local *heating* of the water around the cylinder, and the local *cooling* of it in the radiator. The homely saucepan of water provides a parallel. When it commences to boil, the water heated at the bottom of the saucepan rises and then circulates down the sides again. The thermo-syphon system has the virtue of simplicity, and, always provided that the designer has arranged his piping with adequate care and consideration for the governing theory, has much to commend it.

The Engine Summarised.—That finishes the detail of a single-cylindered engine. I have not dealt with the system of ignition known as the coil and accumulator, because, although still much in use, it is falling out of the firing line before the all-conquering high-tension magneto, and because its principle is so well known. On some cars both the H.T. magneto (occasionally the L.T. magneto) and the coil and accumulator systems are fitted, the latter in such cases being generally held in reserve in case of the failure of the former.

It only now remains to summarise the foregoing and to point out what differences exist between the single-cylindered engine with which we have been dealing, and the two-cylindered, the four, and the six. I will, then, endeavour to show just how the power generated by the engine is transmitted to the road wheels of the car.

The single-cylinder engine, as I have explained, has these four strokes: (*a*) suction, (*b*) compression, (*c*) firing, (*d*) exhaust.

In the case of a "twin" engine, the two pistons are set at 180°, and the strokes occur relatively in this order:—

1*st Cylinder*, as in the single above.

2*nd Cylinder*: (*d*) exhaust, (*a*) suction, (*b*) compression, (*c*) firing—so that the power in the "twin" is developed intermittently, the explosions occurring one after the other at a space interval of 180°.

With a four-cylindered engine, however, we get an explosion regularly at each half revolution of the crank shaft, while with a six-cylindered engine the firing strokes overlap, one explosion taking place every time the crank shaft turns through an angle of 120°—that is, at every third of a revolution.

The chief advantage of a multi-cylindered engine is, of course, a greater evenness of running. Where, as in the case of the single cylinder, the flywheel's momentum alone has to be relied upon to turn the engine three strokes out of four, greater or lesser shock is inevitable. That shock may be said to decrease (other things being equal) with the number of cylinders employed. The four-cylinder, with its power impetus being imparted at each half revolution of the crank shaft, is quite notably smooth in action, and is by far the commonest engine in use. When we get to the six-cylindered engine, we are in the realm of luxury.

At the same time it has to be remembered that an increase in the number of cylinders multiplies the liability to mishap and increases cost. But the reliability of the modern motor is quite wonderful, and the man who buys a four-cylinder car is not, therefore, buying trouble. In the sum of the running cost, the upkeep of the engine mechanism is one of the smallest items.

The simple illustration (Fig. 3) will convey a very clear idea of the volume of power developed by singles, twins, four-cylinder, and six-cylinder engines during the four strokes in the complete cycle of operations.

Part II.: Transmission.—Practically every vehicle which possesses a petrol engine must needs have a transmission gear and a mechanical contrivance for varying the speed of the engine relative to that of the road wheels. The transmission gear is connected to the engine through a clutch, which, when in engagement, connects the engine and gears, and which, when thrown out of engagement, leaves the engine free to rotate without giving motion to the road wheels. If a petrol engine could start from rest by merely opening the throttle, and could do its work steadily from a standing start, the clutch could be dispensed with, but our engine's characteristics are such that, without being rotated at the commencement, it cannot get moving—excepting, of course, by "switch starting," which, however, is also dependent upon the engine being "free" before it can eventuate.

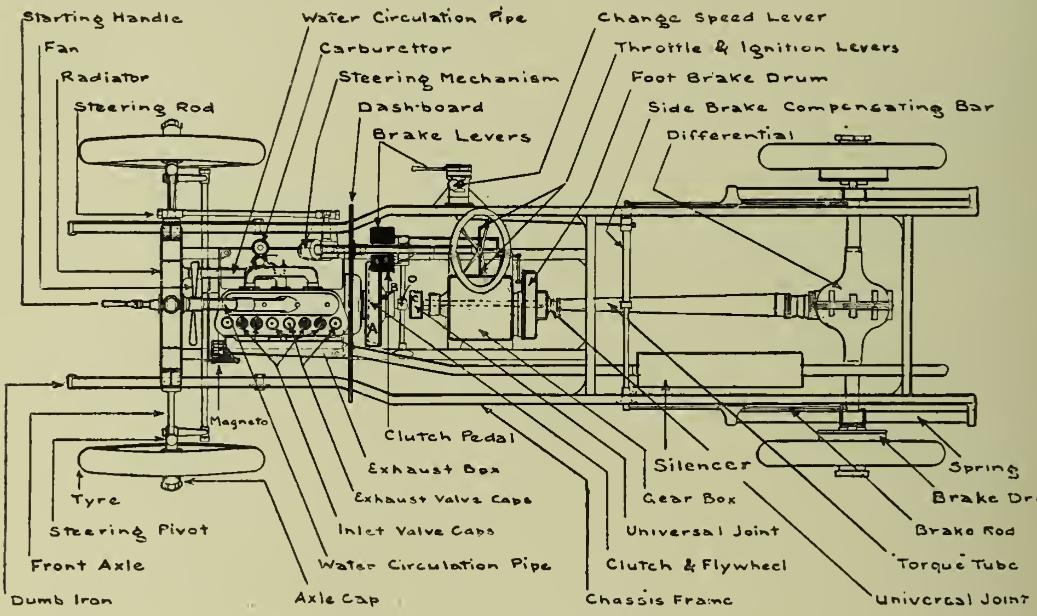


FIG. 4.—PLAN VIEW OF TYPICAL CHASSIS.

The illustrations (Figs. 4 and 5) give us in plan and side view a typical British chassis, with a four-cylindered engine, a cone clutch, sliding gears, shaft drive, and live axle. This will, I doubt not, suffice to initiate even the most uninformed into the why and the wherefore of those features most usually met with in the modern car. Each important member or part has been carefully marked, so that by reference to the drawing any otherwise inexplicable phrase will become clear. Let us run through the lettered features as briefly as possible.

The Clutch.—The clutch occupies a position immediately between the engine and the gear-box. It consists of a female member (*A*) attached to, and constituting part of, the flywheel. The portion (*B*) is connected through a flexible joint (*C*) to the gear-box, and possesses a collar (*D*) against which the clutch pedal (*E*) can thrus when the driver desires to de-clutch (or take the clutch out) and leave the engine free.

The essentials of a clutch are: (1) Gradual engagement, in order to avoid undue shock through letting in the clutch too quickly when the ratio of motion of the two members is different—that is, when the two parts are revolving at different speeds. (2) Large contact surfaces, so that the slipping and frictional effects may not disintegrate the wearing faces too quickly.

There are several forms of clutches in use, each with its own good points: (1) Cone clutch, (2) multiple disc, (3) expanding, (4) metal plate. The cone clutch usually combines a leather surface to give the necessary gradation and ease of engagement, while the multiple disc, as its name implies, has, for a similar purpose, a quantity of metal plates, forced into close contact by a spring and running in oil. The expanding type is very similar in principle to a road wheel brake, and has much to recommend it, although it cannot be said to be very much used. The last type, the metal plate, as used on the De Dion and Rover cars, is notable for the little attention it needs once it is in adjustment.

The flexible joint (*C*) is advisedly placed here, as the cross strains and twists to which a car is subjected on the road are calculated to throw the engine out of line with the gear. This joint permits of these two (engine and gear) being, to a limited extent, out of alignment without ill-effect.

The Gear-box.—In the necessarily brief comparison between the steam and petrol engines I gave something of an indication of the function of the gear-box. Since the internal combustion or petrol engine can only develop its full power when working at a normal speed, it becomes necessary to interpose some device between the engine and the road wheels (or the mechanism operating the road wheels) that will reduce the effect of the drag or tractive resistance of the car upon the engine under unfavourable conditions. That resistance is, for example, much greater when the car is just moving from a stationary position, or when it is hill climbing, than it is when the car is running on the level at a good pace. Obviously, it would be absurd to fix the gear, or speed relationship between the engine on its direct drive and the road wheels, at the point where the engine, turning at a speed of greatest efficiency, was only just moving the road wheels around. But, quite as obviously, some provision must be made for standing starts, hill climbing, and the like, where the conditions require a change in the speed relationship of engine and road wheels, in order that the extra resistance of the car and load on the engine may be overcome.

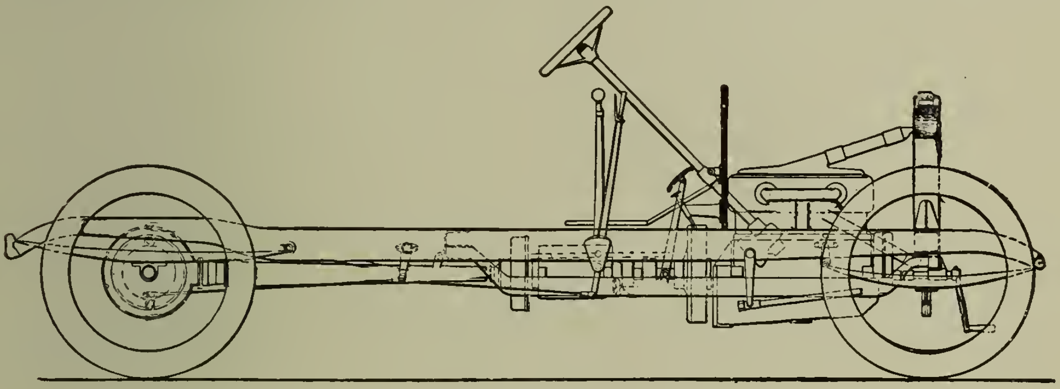


FIG. 5.—SIDE VIEW OF TYPICAL CHASSIS.

It is quite true that some engines are so well designed and constructed, and so adequately fed with correctly proportioned gas (due to proper mixing in the carburettor), that the range of power they can develop is often equal to wide changes of condition in running. So that, on some cars of my acquaintance, it is quite possible to start from the stationary position, climb hills, and develop a speed of nearly forty miles an hour without once coming off the direct drive. This elasticity of power, or engine "flexibility," is one of the results that an automobile engineer is always striving for, but, whatever his measure of success, there are fairly sharp limits beyond which he cannot go. Sooner or later the conditions of road travel imperatively call for a change in that speed relationship between engine and road wheels, and if the change is not wrought the motorist may look out for squalls in the sure and certain hope that they will arrive. The direct drive is, therefore, arbitrarily fixed at a point that allows the engine to revolve at its normal and most effective speed while propelling the car at the requisite rate along the road, and a change speed mechanism is provided to enable the driver to keep his engine working sufficiently fast under varying circumstances.

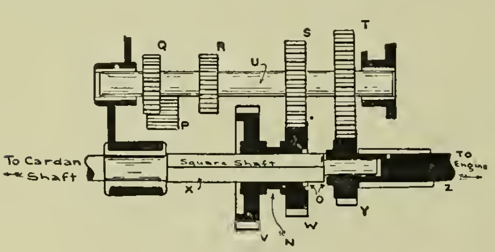


Fig. 6.—Gear Box.

And its Contents.—Let us, therefore, in consultation with Fig. 6, see what happens in this gear-box, remembering that in this case we have three speeds forward, and a reverse, the reverse, of course, enabling us to move the car backwards if required. In addition, there is a neutral position—that is, a position where the gear wheels which revolve shaft (X) are not in mesh at all, so that the engine is cut out from the propeller shaft, and all connection with the road wheels. If this neutral position were not provided, the driver, upon starting his engine up with the starting handle in front of the car, would find the vehicle coming at him. As a matter of fact, several serious accidents and some fatalities have resulted from the omission of the driver, when stopping his engine by switching off the current to put the lever that operates the change speed mechanism into neutral position.

Now. Start with shaft (Z) in Fig. 6. This shaft is integral with the male portion of the clutch, and carries on its rear end, a gear wheel (Y). The end of the shaft is hollow, and acts as a bearing for shaft (X), which extends back and out of the gear-box, and is connected to the driving or cardan shaft. Shaft (X) is square in section, and has, slidably mounted on it, a twin gear-wheel (W V). Parallel to the shafts (Z and X) is a "lay" shaft (U) mounted on suitable bearings. This possesses four gear-wheels rigidly keyed to it. The front one (T) meshes with (Y), and the rear one meshes a small wheel (P) and forms part of the reverse system already referred to. The shaft (Z) can be rotated (by the engine), but will not turn the shaft (X) unless and until certain gear-wheels are in mesh. The lay shaft, however, will revolve idly, being moved by the pair of gears (Y and T).

Now slide the double gear (W V) to the left until (V) meshes (R), and we have the "low speed" because the rear shaft (X) is rotated, but at a very much slower speed than the engine, since the relative sizes of the gear-wheels reduce the speed. Again, if the double gear be moved to the right until (W) meshes (S), as we have it in the illustration, we get the "second speed." In other words (Y) moves (T) which rotates (S), and therefore (W) has to revolve also.

In order to obtain the "top speed," the double gear (W V) is shifted further to the right until the "dog-clutch" (O) engages. In this position the two main shafts (Z) and (X) are positively locked together, giving a direct through drive, while the lay shaft merely rotates idly. The reverse speed is obtained by sliding the double gear (W V) to the left, so that (V) meshes with the small wheel (P). A fork is used at (N) to operate the sliding gear, which, in turn, is operated by a hand lever at the side of the driver.

The "Gate" Change.—That finishes an ordinary three-speed gear-box, but the same principle is applied when four forward speeds are provided—four speeds being the maximum number obtainable. In another and more modern type of gear-box, however, we have what is known as the "selective" or "gate" change gear. The illustration (Fig. 7) shows that in this type of gear-box (having three forward speeds) there are two separate gears, mounted slidably as before, but each with a separate fork, while the side lever is so arranged that it can select either, according to the change desired. A direct result of this plan is that a change can be effected from any one to any other speed, without running through the intermediate gears. The instant one pair of gears is unmeshed, the "neutral" position is found, and the engine is cut out from the road wheels and turns idly. Another advantage, a constructional one, lies in the fact that it is possible with the selective gear-box to make the shafts much shorter, and, therefore, much more rigid. I make no reference to the epicyclic type of gear change. It is passing out of use to-day, so that explanation of it, of necessity very long and very intricate, will be omitted.

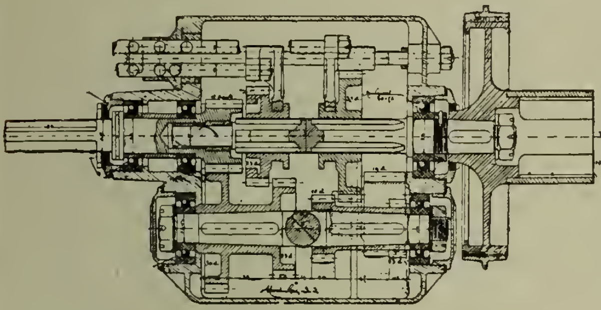


FIG. 7.

The Cardan Shaft.—So much for the gear-box and its contents. An understanding of the method followed can, unfortunately, only be obtained by concentration and some mental agony. Having once got a grip on it, however (the illustrations assisting), we may follow the drive by way of the "cardan" shaft—popularly, but erroneously, so called, after the alleged discoverer of the idea. This form of shaft constitutes about the best and simplest method of getting over a difficulty of transmitting power between two planes which do not coincide. In its application to the motor-car it moreover provides the flexibility necessary between the gear-box shaft and the back axle pinion wheel, as these two members change their relative positions, due to the flexing of the car springs. The back end of the gear-box shaft is provided with a double swivelling block (or universal joint) to which is attached the propeller shaft extending to the axle; this combination is inclusively known as a cardan shaft. It is a notably reliable and neat system of transmission, and although it is responsible for the absorption of about 4 per cent. of the engine power, that disadvantage is insignificant by comparison with the shortcomings of the only practical alternative, the chain drive, with its noise and dirt and constant need for attention.

The Back Axle and Differential.—The ordinary "live axle" is a very dark mystery indeed to the uninitiated. Not that its functions and contents are so very intricate, but because an amateur rarely gets an opportunity to see what is inside the casing, and because, in order to understand, without the thing dismembered before him, he must have a certain grasp of technical principles. I will endeavour to explain as simply as possible.

It is noticeable that when a car is driven in a circle or round a corner the outer wheel has to travel a longer path than the inner. If the axle were in one piece, with both road wheels joined to each end of a single shaft, clearly, either the inner or the outer wheel would be compelled to slip under such conditions. And that would be blue ruin to tyres and wheels, and would absorb an immense amount of power. It is necessary, therefore, to provide means whereby a compensating action can be embodied between the wheels. The mechanism by which it is accomplished is on an old principle, and, as applied to motor-cars, has proved most efficient, rarely giving trouble. In order to be as comprehensive as possible, I give two illustrations, one (Fig. 8) being a (laudable) attempt to show, in diagram, the principle of the differential, and the other (Fig. 9) a presentation of the genuine article, revealing the method of carrying the gear on ball bearings inside the shell casing. The casing serves the double purpose of dust cover and oil bath.

Refer to Fig. 8. The road wheels (not shown) join on to the "live" axle (*E E′*), which carry between them the all-important balance gears. The cardan or propeller shaft (*A*) lies at right angles, and is provided on its rear end with a bevel pinion (*B*) (or, as alternative, sometimes a "worm" gear), whose function is to engage with the large bevel gear (*C*) generally known as the crown wheel. On this are mounted "planet" pinions (*F F′*), which, in turn, and in a prearranged way, mesh between the two bevel gear wheels (*D D′*) which are fixed on to the axles (*E E′*).

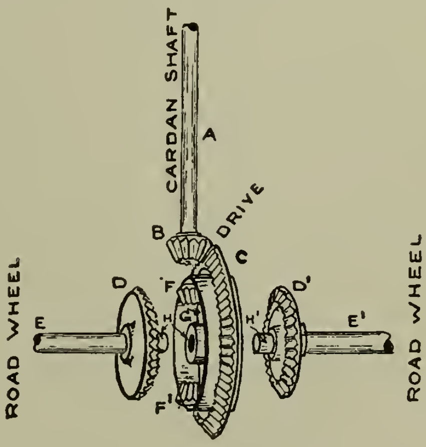


FIG. 8.—DIFFERENTIAL.

The Differential in Practice.—If that is fairly clear, we can now look into the action of this combination of wheels and learn something of its many possibilities. We will suppose the device to be mounted on a car and power applied to the cardan shaft, so that the driving pinion (*B*) is turned. The result is that the "crown" wheel (*C*) rotates and carries the "planet" wheels (*F F'*) round with it. Now, since the teeth on each side of these are in mesh with the two gears (*D* and *D'*), they compel the latter to rotate, and cause the shafts (*E* and *E'*) to revolve also. The fact that they are held on each side by the gears (*D* and *D'*) prevents them rotating on their own axes, and, consequently, to all intents and purposes (assuming the car to be steered in a straight line), they act merely as "dogs," and do not function as gears. It is only when corners have to be negotiated—that is, when one road wheel has to go faster or slower than the other, that their virtue as gears is indispensable.

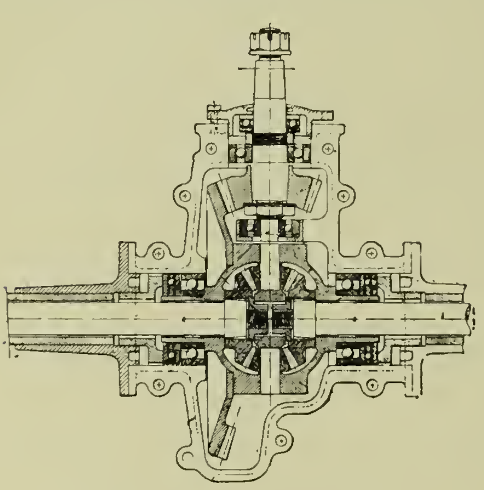


FIG. 9.—DIFFERENTIAL ASSEMBLED.

Put the matter to the test of a simple experiment. Let us stop the car, raise one road wheel (say that on the left-hand side) from the ground, and start the engine again. What happens? The driving pinion (*B*) turns the crown wheel (*C*), which commences to carry the planet pinions (*F* and *F'*) with it. The shaft (*E*) and its wheel (*D*) cannot move, and so the planet pinions (*F* and *F'*) have to rotate on their own axles, and compel (*D*) and its shaft (*E*), as well as the road wheel, to revolve—at twice the ordinary speed, as a matter of fact, that would be possible on the straight road. That is an exaggerated example of the sort of action that takes place at curves and corners. The little planet pinions can balance one road wheel's speed against the other, and provide an absolutely positive and correct speed ratio for both.

Apart from its strict utility as a compensating device, the differential gear is invaluable as a side-slip minimiser. Supposing that the gear were dispensed with on a straight but greasy road, and for a moment one wheel can find no adhesion. The other wheel is compelled to take all the driving force, which would probably make it slip as well. But with a differential embodied, this is changed, because the instant one wheel loses grip, the power of the engine is proportioned between driving the *gripping* wheel and revolving the *slipping* wheel. So that no more, if as much, power is applied to that wheel which is gripping on the road than is applied to the slipping wheel.

So. As thoroughly as possible in the space available, we have traversed the engine and the transmission from A to Z, and all that is left to us is classifiable under the heads of chassis and body. Under "chassis" we may also treat the steering gear, braking system and control mechanism. All other details, regarding shape and design, generally, are moot points, and, therefore, no fit subject for present consideration.

Part III.: Chassis.—We owe much that is good on the car to the French, nor do we fail to perpetuate our recognition of the fact by the use of their nomenclature for things motor mechanical. The word "chassis" is an instance. We should have to delve deep into Webster to find the dissyllabic word that would indicate, as "chassis" does, the assembled frame, wheels, springs, not to say the power plant and transmission. Much thought and more work have been devoted to the subject of chassis design than is usually credited, and it is deserving of more extended treatment than is here possible.

Springing.—The chassis frame is the bedplate of the engine plant. It is constructed of steel, pressed to the requisite shape, and must possess a great margin of strength in order to withstand the buffeting it is subjected to on the road. The designer seeks, therefore, to ameliorate conditions by introducing springs between chassis frame and axle. And here, incidentally, his best efforts have been taxed to their uttermost. A spring, if it is to provide easy riding at ordinary speed, must be long and very flexible. For high-speed work it must be much more rigid if it is to deal adequately with the increased road shocks. No single spring can conform to both conditions. Perforce we fall back upon a compromise, and accept a spring of an arbitrary length, strength, and resiliency.

Brakes.—Brakes can be conveniently dealt with next. And here we can record a fair unanimity of ideas. The side hand-brake is usually designed to operate direct on the back wheels—brake bands gripping steel drums attached to the spokes of the wheels, and connected to the hand lever at the side of the driver. A spring device for the purpose of releasing the brake when hand pressure is removed is, of course, incorporated, and a ratchet "pawl" provided so that the brake pressure can be maintained as long as desired. A second brake acts on a drum fixed to the propeller shaft just behind the gear-box. It is pedal-applied, and has the advantage of being much more powerful than the side brake. A back reference to the diagram of the differential gear (Fig. 8) will show that the driving pinion wheel (*B*) is much smaller than the driven crown wheel (*C*)—so much so, indeed, that it requires between 3½ to 4½ pinion wheel revolutions to turn the crown wheel once. This establishes a huge leverage for the propeller shaft over the axle. A brake pressure of, say, 40 lb. applied to the shaft brake will, consequently, be equivalent to three or four times the same effort as applied direct, by the side brake, to the road wheels. At the same time, it will be observed that a brake applying constantly to the transmission shaft must throw an enormous strain upon mechanism designed primarily for other purposes. The tendency, therefore, toward front wheel braking is very marked, and it is at least likely that the system of to-morrow will involve brake application to all four road wheels direct.

The Steering Gear is a term connoting not only the hand wheel, but all interconnecting links, rods, and pivots also. Since a casual inspection of, say, the humble "taxi" will reveal the object of the latter, I will confine myself to a reference to that essential part of the mechanism which is contained at the base of the steering column. With it is incorporated (see Fig. 10) a "worm" wheel, the purpose of which is to engage and operate a toothed "quadrant." The quadrant is pivoted on a shaft protruding outside the casing, and taking on its end a short steering lever, which translates the motion to the road wheels.

A reliable steering mechanism is absolutely vital, of course. An engine may fail, a transmission may stick, even a brake may belie its name, without serious consequences, but the breaking of one small pin, or the loss of bolt or nut in the steering gear, and—it may be too late to make good resolutions for the future. Therefore, not only should a purchaser assure himself that the car he is buying has a staunch steering gear, but it is an after duty of prime importance not to neglect the precautionary measures necessary to proper maintenance.

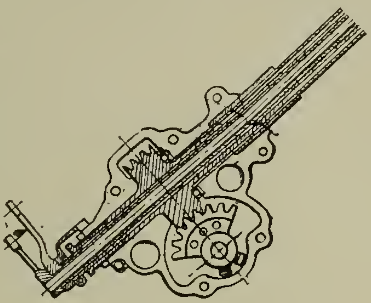


FIG. 10.—STEERING MECHANISM.

Engine Control.—In the remarks on the carburettor and its operations, I called attention to the function of the throttle valve. The throttle valve controls the amount of gas passing to the cylinder. What controls the throttle? A lever on the steering wheel, a pedal under the driver's foot, or both. The throttle is rarely fully open except for accelerating or speeding up, for hill climbing, or for fast work along the level—while the watchmen snore in their boxes, as Carlyle would say! Another factor in engine control is the ignition, or spark advance, lever, by the manipulation of which speed may be slightly varied.

Tyres.—The tyre question is a burning question. Of that there is no manner of doubt whatever. Certainly, if we except the commercial vehicle, the pneumatic tyre holds the field to-day practically to the exclusion of every other form. But that is only because the motorist prefers to bear the ills he has than fly to others he wots not of. On the credit side, the pneumatic has resilience, speed, and comfort for the car occupant, while the considerable ability of the tyre to absorb road shock tends, of course, to the maintenance of the car mechanism in good running condition, and, therefore, makes for longevity. On the debit side, however, there is the haunting liability to puncture and burst, and the inconveniences and delay inseparable therefrom; but above all that there is the enormous comparative cost. Tyres are far and away the largest item in the sum of running expense.

The inventor has, of course, been quite alive to possibilities in this direction, and has tumbled out upon us any number of devices designed to remedy the tyre's defects. Mainly, the idea has been to allow of the substitution of solid or semi-solid tyres by the provision of resilient wheels and the like. The measure of success obtained can be gauged by the fact that the pneumatic tyre stands very much where it did in point of popularity. All the same, we have had great constructional improvements in this form of tyre, while spare wheels and rims have palliated some of the inconveniences consequent upon puncture. Now, when the tyre deflates we clap on our spare wheel and keep on smiling—if we can.

Recently, however, we have had to consider a development along the line of pneumatic suspension which may conceivably provide a solution to the tyre problem. The idea involves the abolition of the old (and present) form of leaf spring, and the substitution of a chamber of compressed air which forms a cushion against which a piston connected with the road wheels presses. It is much too early to say with any degree of certainty that here is the remedy for tyre trouble, but it is undoubtedly a most hopeful line of development. If the pressure in the air cylinder can be automatically adjusted to the varying speeds and loads of the car, it is obvious that not only have we a more adequate form of suspension than the leaf spring compromise, already referred to, can provide, but we have also an opportunity for the use of solid or semi-solid tyres of the Torkington type.

Bodies.—This should properly have a separate section of its own. It is not provided because we cannot, after all, deal with a subject upon which decided views are as futile as masculine convictions upon the subject of ladies' hats. The only certain thing is that comfort is a prime consideration in a car body. That connotes something deep and snug in upholstery, reasonably high sides, and ample leg room. The coach-builder has therefore given us the "torpedo" body. And the *cognoscenti,* ever since, have been raging furiously together in an endeavour to decide whether the "torpedo," flush, high-sided body makes for beauty. We may leave them raging. The "torpedo" body consumes some space, truly, but it is undoubtedly comfortable. Let it rest at that.

From the Driving Seat.—We set out together to try to discover just why it was the wheels went round. We have probed into all the mechanical mystery lying between the radiator and the back axle of a common car type. But the mechanism has not been set in motion. The vehicle has not moved. How shall we get it out of the motor house and along the road under its own power? This way: First, we fill the radiator with water, the tank with petrol, the lubricator with oil. We see whether any other part of the mechanism stands in need of the oil can. This done, a glance is necessary at the tyres. They pass muster. Very well; we are ready to start. Turn on the petrol tap; "tickle" or agitate the needle protruding from the top of the carburettor, which will have the effect of flooding the float chamber and causing the petrol to spurt from the jet to provide an initial richness of mixture; see that the throttle and ignition levers are correctly placed, that the change speed lever is in the "neutral" position, and switch on. A few turns of the starting handle, and our engine is rotating.

Now, get aboard. Seat yourself at the steering wheel; press your left foot on the clutch pedal, thus cutting out or disconnecting the engine from the gear-box. Now take hold of, and move, the gear lever into the low-speed notch. Move the throttle lever on the steering wheel a little more to the "open" position to speed the engine up, and then, and only then, and very gently, let the clutch in. The car will commence to move forward, and strict attention is necessary to the steering. The low speed, you will soon find, is not fast enough, so you again "declutch," quickly and firmly shift the gear lever to the second speed notch, and quietly release the clutch pedal again. The car will commence to gather pace up to quite twelve miles an hour. But the speed mania has gripped you, and nothing but the "top" speed will satisfy. Repeat the previous operation, putting the gear lever into the "top" notch. It is done. You are travelling up to the speed limit.

The Why of It.—It is as easy as that, and it comes about after this wise. You have switched on the current that makes the spark in the cylinder. You turn the starting handle which engages with the crank shaft. As you turn, therefore, you are drawing down the piston, and the piston is sucking in the mixture from the carburettor, through the inlet valve. The valve closes and your piston rises on the compression stroke, and at the moment of greatest compression the spark occurs, explodes the mixture, and drives the piston down with great force. You have finished with the starting handle. The engine is running. All you turn the starting handle for is to get the initial suction and compression of gas in the cylinder and the explosion. The engine does the rest.

But as your gears are in neutral position, the car does not move. You take your seat, take the clutch out, and mesh your gears with the aid of the gear lever at your side, and let the clutch in again. Immediately the drive is taken up—through the cardan shaft to the differential, from whence it is distributed along both sides of the live axle to the rear road wheels.

The rest, when you have grown accustomed to your engine, when you can " feel " it and tell to a nicety the amount of throttle and spark to give to get the requisite speed for conditions prevailing—the rest, I say, is heart's desire. Some there be for whom the car has no delight—who discern in it nothing but an unnecessary complication of an already complex scheme of things. For them the great pity. For us—the Wanderlust and the car.

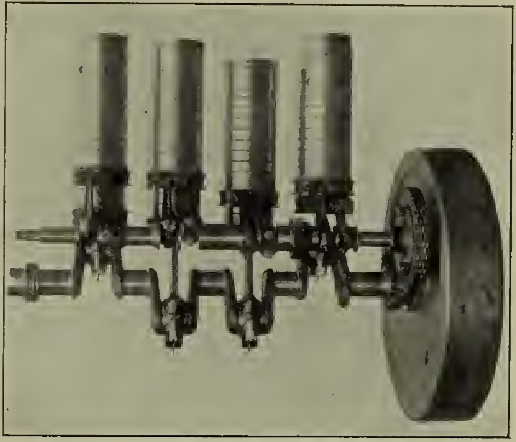
A Final Word.—This in conclusion. We have been dealing throughout our article with a car of commonplaces—just an ordinarily featured modern vehicle. There are, of course, variations from standard practice innumerable. Every part of a car has been the subject of countless attempts at improvement, and, although for every invention relating to motor traction which has been adopted, a thousand exist only to adorn the records of the Patent Office, there are sufficient of the former to require a separate encyclopædia, if they are to be dealt with faithfully. We can do no more than an unseemly gallop through a few.

The worm drive was casually mentioned in the section dealing with the differential. As its name suggests, a worm on the end of the driving shaft engages with a worm wheel which distributes the power to the live axle, and takes the place of the bevel pinion and crown wheel. The worm is generally admitted to have advantages of efficiency and silence over the bevel. It is now standard on several cars, and looks like coming to general adoption.

Then, again, in the transmission department, the gear-box, in its present form, is certainly only here on sufferance. It is a crude idea, that edgewise meshing of toothed gears—" a mechanical crime," Henry Ford, of America, called it. Many attempts are being made to supersede it, and I will be prophetic and name a future for the " Thomas " gear, as yet comparatively unknown for anything but heavy vehicles.

The Knight sleeve-valve engine has been notably successful in practice on Daimler cars, and is now fitted by the Minerva Company also. It may be taken as harbinger of development toward simplicity of valve mechanism, and possibly the final overthrow of the " poppet " or mushroom-headed variety. The latter, however, have done, and are doing, excellent service, and will die hard.

The elusive problem of carburation has agitated many brains—often owned by men of some theory and no practice. The results have sometimes been weirdly wonderful. Where, however, theory and practice have been combined in right proportions, there have been notable advances. To mention one instance only—the Polyrhoe. This is amongst the claimants for wide adoption, and is remarkable for at least one unique feature. The blending of the petrol and air can be actually watched, and the mixture followed on its way through the carburettor.



THE INTERIOR OF A "SILENT KNIGHT" FOUR-CYLINDER ENGINE.

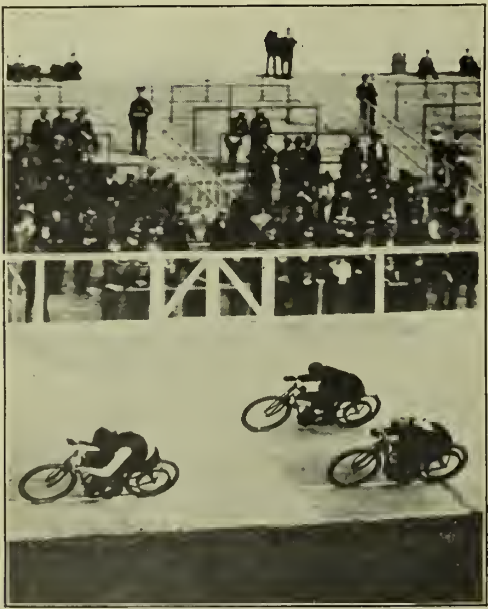
The mere name mention of a few further endeavours toward the perfect motor vehicle must suffice: The Hele-Shaw clutch, Lodge ignition, Challenge reinforced tyre tubes, Allen-Liversidge front wheel brakes, and Amans, Sharpe, and Cowey systems of pneumatic suspension—these and many more.

Edison was once asked to affirm that invention was a matter of inspiration. " No," he said; " perspiration "! He was as wrong as the individual he corrected. Invention is both, and no man can say in what proportion they mix in any particular case. Let us offer thanks to all who have contributed their quota to our service, the great unknown not less than the great known. An invention, after all, is the concrete expression of long generations of thought and work. It stands at the end of a line stretching far back into the dead years. All down that line men have given of their best to bring an idea to final fruition. The inventor is merely heir. In honouring him (when we *do* honour him; when he does not die in obscurity and poverty), we honour the nameless men, his pale progenitors.

This wonderful car, their work, is with us—imperfect still, but still wonderful. It is in its very young youth yet, but it has challenged the form of road haulage that has come to us through the centuries—challenged, and, in a very few years, won. The car of the future will do mightier things. It will doubtless be a far different vehicle from the one we have to-day. "The road of progress begins in the simplicity of crudeness, and runs through the complexity of half-achievement to its goal in the simplicity of perfection." A true word. We may leave the future to itself in content.

Alex. J. M. Gray.

Motor Cycling and the Machine: *The Game and the Handicap.*—If we can agree that sport is a game played for the sake of itself, for the excitement of it, for the recreation and amusement to be derived from it, then I dare assert that in the field of the automobile motor cycling is, generally, better sport than any other form of motoring, except, perhaps, aviation. For those who can follow it, the motor cycle provides more of the essentials of a good game than are obtainable from the car. There is just that element of insecurity to be overcome, just that spice of danger to be avoided, which constitutes the soul of the game. Where the results are a pregone conclusion, there is little left to play for. Without risk, in some form or the other, the lump is robbed of its leaven.



Olympic Games, August, 1908. Close Running in the One Hour Scratch Race.

If this suggests that motor cycling is a dangerous pastime, it suggests other than the fact. Given a certain reserve of resource and individual alertness, and a modicum of good horse sense, and the motor cycle is as safe and, nowadays, practically as reliable as an ordinary pedal bicycle. Certainly, the motor cycle requires more skill to manipulate, more knowledge to get the best results, a little more attention and considerably more expenditure than its democratic, engineless brother, but for all these things, it multiplies advantages in the eyes of the motor cyclist.

I am not prepared to affirm that it is always as handy an instrument of transport as an ordinary bicycle. If the only available storehouse is up or down stairs, it presents difficulties of housing. The flat-dweller must perforce make special arrangements for his stabling. A motor cycle is not always ready for the road at a moment's notice. It is not yet an ideal vehicle for crowded traffic threading. And for dirty weather, when the normal eczema on the high road's face has been watered and churned to the consistency of slime, the possibility of catastrophe from sideslip is enough to deter even the stout heart.

The Balance of Advantage.—Let us admit all the handicaps quite cheerfully. There is no purpose served in carrying a halo amongst our accessories. But, having given the opposition all the case they raise, the motor cyclist is left with a balance of gain for his trouble and expenditure that leaves him hugely content. Practically every improvement in the pedal bicycle is designed to secure greater ease of running. The motor cyclist, with his machine in good fettle, has that a hundredfold. With his free engine and variable gear he can get away with very little more trouble than his big brother in the car, and can run as carefree and effortless. The facility with which a bicycle can take a man out and into the country's heart, the motor cyclist has in superlative degree by comparison. His greater speed is supposed to rob him of many of the sights and sounds that a "push" cyclist enjoys. It does not. He can see all the ordinary cyclist sees, and can study botany and geology *en route* in the same way—by stopping! On the other hand, the oxygenation of the blood is better effected by the speed; he can cover a far wider range of country in the time open to him; can travel from Dan even unto Beersheba, and get to know something of both places, while the cyclist must content him with Dan and its environs (assuming that Dan has an existence and has any environs). He can, in brief, do most things a car or a bicycle can do, at not a prohibitively greater running cost than the latter, and at infinitely less cost than the former, and have the pleasure of speed, the satisfaction of dominating his machine, and an almost indefinable sense of exhilaration born of both, and the chances of the game.

Motor Cycling Races in the Isle of Man, 1909.

That last can only be appreciated by the motor cyclist. It starts with the requirements of balance, and it grows with the pace. There may be no risks upon the road at all, and after a little time balance is maintained automatically and without effort, but the exhilaration is not the less keen. It is the possibility of something turning up that will call for quick decision, instantaneous action, and the knowledge that he is alive to all the risks, and can steer around the danger zone every time, that counts.

A Little History.—But I fear I may be startling the potential tyro. Let him be comforted. I am not an apostle of speed. The law allows twenty miles an hour in the open country, and it is fast enough to give much of the exhilaration referred to. And, besides, twenty miles an hour is not the *minimum* speed. One may drive a motor cycle at almost a walking pace. It is merely a matter of familiarity with one's engine and its adequate manipulation. Time was when it required an athlete to get into the saddle, after a run of any distance, and the work of a very strong man in pushing the machine along until it fired. That is all over and done. We have reached a stage where ease of starting and control are rapidly becoming well-nigh equal to that of a car, and later in this article I will endeavour to show how that result is effected. Meanwhile I only desire to emphasise the point that there is little to deter the man who halts in a decision to-day from deciding to go ahead to the realisation of his desire.

The story of the development of the motor cycle is brimful of interest. It had the same origin, of course, as the motor-car, but, although contemporaneous with its big brother, its rise to popularity has been of a rather more recent growth. The construction of a light internal combustion engine that will act efficiently on the fragile frame of a bicycle, presented, naturally, greater difficulties than confronted the motor-car engineer. With the car, the problem of weight, although pressing enough, was not so vital when a broad base like the car frame was available for mounting. Moreover, when both motor-car and motor cycle were born, the internal combustion engine, so far as its application to road haulage was concerned, was in a very embryonic state. The engineer had all the difficulties he wanted to produce an efficient and comparatively heavy-weight engine for his car. The very light-weight engine could only come in the days of the refinement of production.

3½ H.P. REX CYCLE TAKING BEND IN DEVIL'S ELBOW, ISLE OF MAN.

Now we can construct engines of much less than 3 lb. weight per horse-power—and the rise of the aeroplane (literally as well as metaphorically) and of the motor cycle punctuate the advance. To-day, although a grotesque, we have a motor-cycle engine of 16-20 h.p. among the actualities, and on the racing track for short distances this machine has touched the almost incredible speed of 90 miles an hour. Sixty to seventy miles an hour on the track are, however, comparatively common with engines of one-half (and less) the nominal power of the uncouth Brobdingnagian referred to, while in big road competitions, such as the Tourist Trophy Race in the Isle of Man, averages of 49 m.p.h. for distances of 150 miles have been made.

Factors in Popularisation.—Small need here to deal with the great feats accomplished by the Brothers Collier, H. Martin, H. V. Colver, Lee Evans—to name a very few of the more prominent. Unnecessary to emphasise the contribution which competitions have made to the evolution of the finely, almost delicately, balanced mechanism that constitutes the motor cycle's motive power and transmission system. Almost redundancy to write of the part the local clubs have played in the popularisation of this slim expression of tractive efficiency. These things are known and appreciated wherever two or three meet together with an interest in the machine. The others are not to be enthused for the game by a recital of the dry facts and figures of advance. The real torch that sets the flame of desire ablaze with these is the motor cyclist himself, slipping along the high road without effort, or skimming the competitive track at swallow speed.

That torch (and others) has functioned very effectively indeed, if we may judge by the number of motor cycles in commission at the present time. An examination shows that, although a few years ago the pessimist was forecasting the extinction of this form of transport altogether, and finding, it must be confessed, considerable ground for his dismal foreboding in the stagnant trade conditions then prevailing, the sum of the motor cycle to-day approximately equals the total of other motor road vehicles. At the same time, imports of motor cycles and parts into the United Kingdom are at their lowest, having been steadily declining for several years, while exports are mounting in a manner that must make for a state of much complacency in the mind of the man concerned with local economic problems. In 1909, for example, exports simply doubled themselves, and although there is, of course, a fairly well defined limitation to that sort of expansion, the present auguries are all for a state of continued good business. Quite certainly, therefore, the motor-cycle industry is a factor of no mean importance in the nation's commercial activity.

My part here, however, as in the case of the article on the motor-car, is to deal with the why of the motor cycle's movement. It will not be so difficult, because the essential process of power generation is the same as in the car, and those who wish to familiarise themselves with the happenings inside the engine need only turn back to that section of the motor-car article dealing with it. The mode of transmitting the power is different, certainly, and to that difference I shall give due attention. Furthermore, the question of personal comfort and the amelioration of the motor cyclist's lot generally has to be traversed.

The Two Classes.—And now I am in a quandary. It is my wish to interpose upon this page an illustration of a machine which we can "vet" and discuss. There's the rub. Unlike the car, the motor cycle to-day is presented by our honourable manufacturers in a great variety of shapes and designs. They do not seem to be able to agree as to what a motor cycle should resemble. I am forced, therefore, to depict two machines, a "heavy-weight" and a "light-weight," as being typical of all that is best in the realm of motor cycles. Let me explain. A heavy-weight is a machine of 3 h.p. and upwards, weighing at least 150 lb. A light-weight, of 1¼ to, say, 2¾ h.p. would scale from 70 to about 140 lb. They constitute two distinct creations, and their essential merits are a moot point still among practical motor cyclists.

It is certainly strange at first sight why motor cycles should have become separated into two camps. But the reason is not far to seek. The original motor cycle was an adaptation of the pedal cycle with a motor attachment. It was, to put it mildly, not a success. It added much weight, but failed to add the necessary power to move the weight. Out of that impossible condition the heavy-weight machine had its rise. It was borne in upon the maker that, however much was sacrificed upon the altar of weight, adequate power must be available. And then it became obvious that if the power was to be adequately transmitted to the road driving wheel, the engine and mechanism would have to form an integral part of the machine, and not a sort of adventitious attachment thereto. The result of his efforts may be seen in the modern heavy-weight, which will go anywhere without pedal assistance, and is capable, if necessary, of driving a passenger-carrying attachment and full luggage equipment as well.

BROOKLANDS, 1909. START OF MOTOR CYCLE RACE.

As for the light-weight, one can correctly pronounce it as owing its existence to the high state of excellence to which motor design has been brought, whereby a light and high-speed engine became possible. The designer of the light-weight lays it down that if, by providing a reliable little engine of just sufficient power for 90 per cent. of the day's work, he can make a machine of half the weight of the heavy motor cycle, he is fully justifying his production. By this reduction in weight the effective pedalling power of the rider is considerably more than doubled, so that he can, with a comparatively small muscular effort, give enough material assistance to the motor to overcome the steep hills representing that contingent 10 per cent. for which the engine does not provide. Apart from these considerations, the light-weight makes out a good case for itself from the view-point of first cost and running charges. Given a free engine, and its future for solo work will, I think, be undoubtedly great. Let us now consider the two types, beginning with the heavy.

The Heavy-weight Motor Cycle.—First of all, what economic considerations decide the locality each part shall have? From the illustration it is apparent that the engine occupies the only space available. It is "hung" as low as possible in order to improve stability. It is placed vertically, since the functions of the cylinder take place in the head, and, therefore, that department deserves to be located where dust, wet, and rust can least interfere with those functions. This premise granted, it is obvious that the tank is also well situated. And that leaves us free to consider detail more closely.

Contrary to car practice, the engine is placed across the machine, *i.e.*, with crank shaft at right angles to the frame. Although the flywheel is not apparent, it is there, incorporated with the engine cranks, and, therefore, contained within the crank case. The carburettor can be seen to the left, behind the engine, where it is fairly well protected, and can get the advantage of the warm air radiating off the cylinder. One effect of petrol being vaporised is to lower the temperature of the carburettor to well-nigh below freezing. It is this that the warm air tends to counteract.

Connection is made between the tank and the carburettor by a petrol pipe, which is provided (as a safeguard against stoppage) with "sludge" and dirt catchers. The magneto can be seen placed forward to the right below the "down tube" of the frame. A chain (or gear) drive from the crank shaft to the armature of the magneto causes it to rotate and deliver its spark in due season.

The position is not ideal for the magneto. It is wet and muddy down there some days. But the manufacturer has difficulties. He cannot place his magneto in front of the cylinder, for the reason that it would keep the latter from getting the full benefit of the air circulating about it for cooling purposes. He refuses to place it behind the engine, as he decides (from experience) that a magneto and carburettor must not be in too close an association. Because, if the carburettor were to "flood" over at any time, any stray sparks from the magneto contact-breaker (and they sometimes occur) would ignite the petrol vapour. In which case the rider would be well advised to dismount in haste without bothering about dignity.

Cooling, Control, and Transmission.—The cooling of the engine is effected, as I mentioned early in the chapter on the car, by the circulation of air conducting the radiating heat away. "Gills," to be seen in the illustration, are cast round the cylinder in order to present an increased metal surface to the air, and hasten radiation.

Engine control is from the handle-bar, where there is (*a*) a throttle lever and (*b*) a "hand air" lever, by the agency of which one can vary the strength of the mixture. The magneto spark advance lever is operated by a control attached to the tank. A further hand lever is provided by which the exhaust valve can be lifted off its seating. With the exhaust valve open, there is no adequate suction on the carburettor, no compression in the cylinder, and the engine stops firing. This last is a great convenience in driving through traffic, as not only does the engine stop, but it also acts as a resistance to the free running of the bicycle. In other words, the engine functions as a brake.

There is a lubricating-oil compartment in the fore-end of the tank, from which the oil can be forced by hand pump to the engine crank case. From here it is picked up and splashed above by the flywheel cranks, ultimately reaching the cylinder walls and finishing its task.

That completes the engine, and we may turn to the transmission. Here, too, are many divergencies from car practice. Only in one or two cases have the manufacturers been successful in their adaptation of the transmission system of the car. In point of fact there is little need for the car type of sliding gear in a motor cycle. The average 3½-h.p. bicycle has ample power for all conditions, saving, perhaps, the steepest of hills, or when it has a side car attached. To cope with this we can fit (although not absolutely necessary) an "Epicyclic" two-speed gear of the most efficient order.

Our machine is shown with belt drive. The engine shaft has mounted on it a V-pulley, while a V-grooved drum is attached to the spokes of the back wheel. Finally, a belt connects the two and completes the transmission.

The Free Engine.—In the prologue I mentioned the advantage of a "free engine." With the belt drive, as I have described it, it is necessary, unfortunately, to stop the engine if one desires to stop the travel of the machine. Not so with the free engine clutch machine. There are several good expositions of this device on the market, a good one being the "Triumph," although it gives no variability of gear. The belt drum is mounted on a separate axle concentric with the road wheel axle, and a spring pressed multiple disc clutch connects the two. If the clutch be withdrawn (by a pedal operated by the right foot), the back wheel and belt drum wheel are disconnected, and the engine can therefore rotate, although the machine is stationary. A further important feature is that the pedalling chain and free wheel are mounted on an extension of the axle of the belt drum wheel, and so the engine can be started by a single thrust with the foot on the pedal, while the machine remains at a standstill and without propelling it along. It happens in this way. First, we declutch by pressing on the right-foot pedal referred to. That cuts out the engine from the road wheel, so that the machine may be pushed along without the engine working at all, or the engine may be working without transmitting its power to the road wheel. That is the engine in its "free" position. To start the engine, all that is necessary is to thrust on the cycle pedal which is connected to the belt drum by the chain; the belt drum revolves and conveys the motion to the engine *via* the belt. It is exactly the same operation as starting the car by the starting handle.

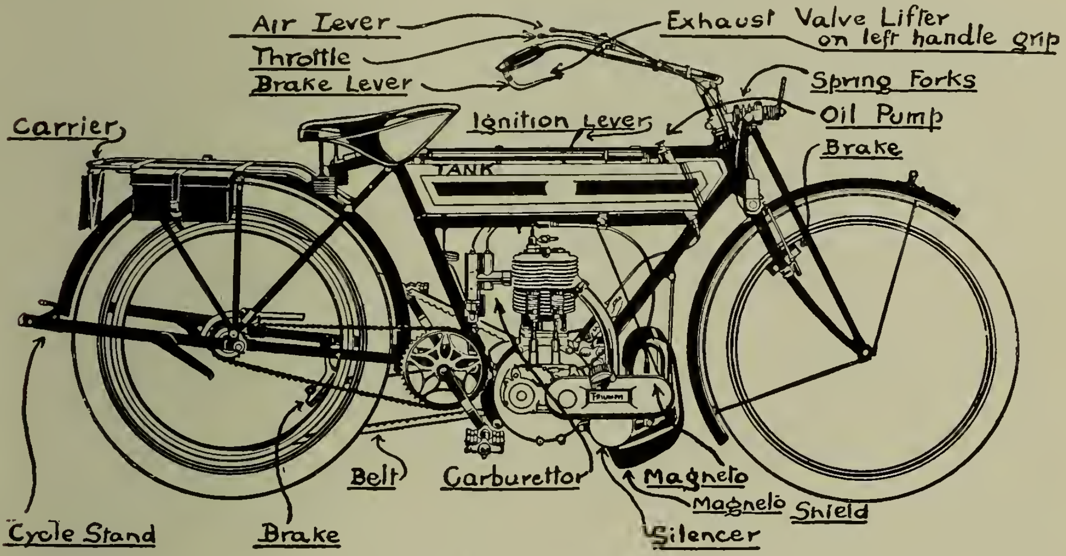


FIG. 11.—A TYPICAL HEAVY WEIGHT.

Whatever device is adopted (and, as I have said, there are many), so long as it functions efficiently, this is an enormous gain. It does away with the starting difficulty (that struggling run with the machine until the engine fired, and the subsequent hurried vault into the saddle) which made motor cycling impossible except for the athletic. It does away with the necessity for driving quickly through traffic, and slippery places, in order to prevent the engine from stopping—a very dangerous habit indeed. To-day (in the sere and yellow leaf perhaps?) you take your machine, "declutch," "tickle" the carburettor, press once or twice on the pedal, and your engine is running. You get astride the machine, and, with befitting dignity, quietly let in the clutch, and—away.

The "Epicyclic" two-speed gear I have referred to can also be incorporated in the back hub, and has the advantage of providing not only a free-engine clutch, but also a low gear, which has decided advantages for traffic driving where slow speeds are necessary, while it is more than an advantage for starting on single-figure gradients, and for passenger or side car work. Its chief drawback is in the great extra weight which has to be borne by the back wheel.

The Light-weight Machine.—The light-weight machine needs little space. It conforms in principle, although not always in the disposition of its parts, with the heavy-weight. One usually sees the engine neatly inclined forward, lying parallel to the front down tube of the frame, with the magneto placed behind the cylinder and bolted to the crank case. There are few other material differences. The cycle illustrated (Figs. 12 and 13), La Motosacoche, shows the complete machine with its enamelled metal wings, covering in the engine—an admirable feature from the point of view of cleanliness and appearance, while Fig. 13 shows the complete engine and control.

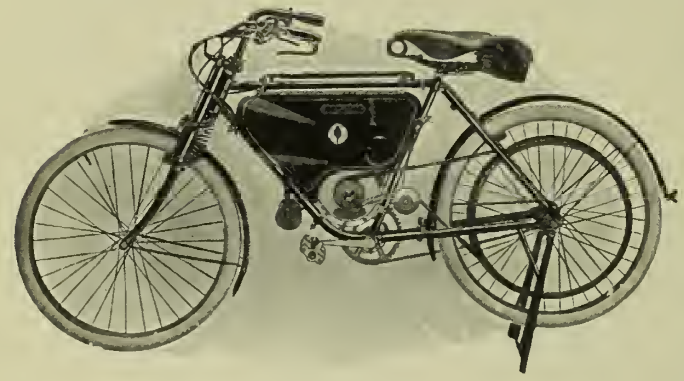


FIG. 12.—A LIGHT-WEIGHT MACHINE.

Shock Absorbing.—Come we now to the all-important question of riding comfort. And here we are up against a very legion of spring forks, saddle pillars, and the like, quite impossible, in the space available, to deal with adequately. It will be best, therefore, to confine ourselves to a statement of the requirements, leaving the selection of the particular shock-absorbing device to the judgment of the purchaser.

There are two distinct vibratory effects to be dealt with, those arising from inequalities of the road, and those set up by the engine itself. To palliate the former, some absorbing agency must be incorporated in the front fork, without in any way weakening the mechanical strength of this sorely tried part of the machine. In addition, it is very desirable to mount the saddle on spring buffers having a vertical motion. When we come to deal with the problem of engine vibration, however, our difficulties are not so easily surmounted. Engine vibrations are characteristically short and sharp, and, therefore, are not really palliated by the saddle suspension. It is, however, possible to oppose their effect by the use of spring handle-bars, which, although an advantage to an extent, makes steering rather more difficult to the neophyte. On a motor cycle the vibrations of the engine become less apparent as the cycle gathers speed, but, on the other hand, the effect of the road shocks becomes more harassing. I am, however, not after making a bogey of vibration. It is certainly ever present, but not to anything like the extent imagined. Moreover, just as I expressed much hope of pneumatic suspension in the car, so I imagine that the application of some air spring device will overcome a considerable percentage of the vibratory difficulty in motor cycling.

Sartor Resartus.—When Adam delved and Eve span, clothing was not such an important matter as it is to-day—particularly to-day on a motor cycle. Boreas is very rude, and contributes nothing to the mental peace or bodily comfort of the man who tries conclusions with him at a speed of—the speed you travel on a motor cycle. In addition, there are other adverse climatic factors to be met and overcome. If it is not always cold and wet, it is often one or the other. What we require, therefore, is a combination of heat-conserving and wet-resisting raiment. Wool underclothing, a woollen vest with sleeves, a rough dust-coloured jacket and trousers, with cloth gaiters, and, over all, a well-lined three-quarter overcoat, will do for fair weather. For foul and wet, a complete outfit of rain-proof overalls, while a leather waistcoat is "always handy and useful." Gauntlet gloves of lambs' wool inside and out, a golfer's boots with a one-piece, water-proof tongue, for the feet, and a well-lined cap with ample peak for the head, will about complete the get-up.

Luggage Space.—If I have left this topic to the last, it is not because it is of the least importance. The motor-cycle designer rarely pays enough attention to the provision for the carriage of necessaries on the road. With a little systematic planning, however, it is possible to stow away a quite surprising bulk of gear—certainly sufficient for a good tour. The back carrier should have a long case made to fit neatly. This will hold a partial change of underclothing and the inevitable tooth-brush. On the handle-bar there is room for a light carrier to take the overalls. Immediately below the handle-bar, clear of the knees, and hanging pannier-fashion across the tank, it is possible to provide a convenient double tool bag. On the front mudguard extension I should specify a small flat case in which to carry puncture and tyre repair outfit, spare carbide for the lamp, tyre levers, &c. There is one other space, forgotten and unfilled, and that is between the back mudguard and the seat pillar down tube. Here we can place a properly shaped kit, wherein to stow the over-plus of everything and anything which always crops up at the last moment.

Variations.—I think that is all. I have made no attempt to deal with the many points of divergence from the general lines of the typical machines I have endeavoured to describe, for the reason that, even more than in the case of the car, those variations are far too many to compress into the limits of this article. My purpose has been to provide material that will serve as a sufficient introduction to the sport and pastime of motor cycling, and to the general principles of the machine's construction. No more than that. There are auto-cycles available to-day (the F.N. being perhaps best known) with as many as four cylinders, and with transmission systems that follow car practice (in many respects) exactly. Although I have referred to a single-cylindered machine only, there are, of course, a very large number of "twins" on the market. For the reasons given in the car article, the increase in the number of cylinders makes for smooth engine turning. The increase in the case of the motor cycle, in addition to ensuring this smooth running, is made generally, so that higher power may be available. Not always, however. In the Moto Reve, for example, we have a beautifully designed light-weight "twin" of comparatively low power—2 and 2¼ h.p. to be definite.

Then again, we have the "two stroke" Scott. In two-stroke engines, instead of the power stroke occurring once in four, it occurs once in two. This form of engine is in a comparatively embryonic stage of development, but the Scott machine has, nevertheless, given very strong proof indeed of its efficiency. It is likely enough that the two-stroke principle will be presently applied much more widely both to motor-car as well as to motor cycle work.

In regard to transmission. The chain-drive, as distinguished from the belt, is fitted to one or two makes of motor-cycles, and upon the Indian has, both in track and road competitions, fully justified the claims of its sponsors. In the Indian, again, pump lubrication is a feature of no small importance. And so on.

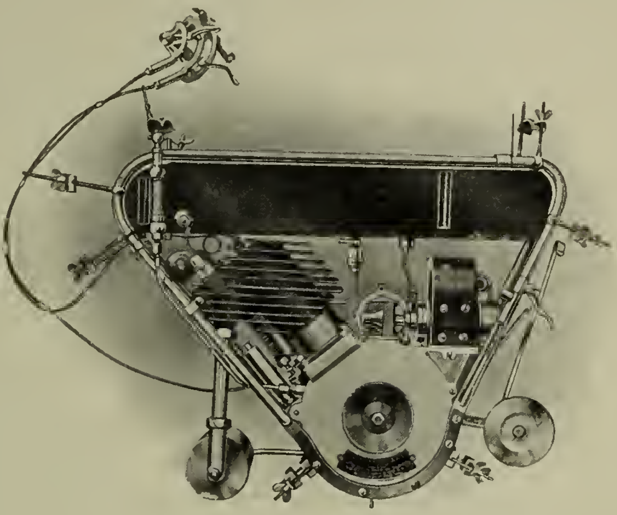


FIG. 13.—ENGINE AND CONTROL OF LIGHT WEIGHT.

In Conclusion. — Now. We have the machine. We want the man. He is recruited from the ranks of the men of middle means. I have endeavoured to cater for his requirements, even though he also be of middle age, and in quest of rejuvenation, in a comfortable well-sprung machine, the two-speed gear, and the free engine. An it please him the better, there is the light-weight with negligible cost of upkeep. Of his ultimate satisfaction I have little fear. *He* need have little fear concerning mechanical pains in the engine provided it be lubricated wisely and well. He will find his tyres as easy of repair as those of his old pedal cycle, and the steering is the same. He has the assurance that, as a means of recreation, there is nothing cheaper except the pedal cycle he has discarded. The range of the motor-cycle's action is as great, and the speed that he can travel the equal, of the car. He is a motorist at less than one-quarter the capital cost and at one-tenth the running charge of his big brother on four wheels. He is nippier, handier, readier. He is, in short, in all the essentials of that term, a king of the road.

ALEX. J. M. GRAY.

GLOSSARY.

NOTE.—As this glossary is intended principally for use with the text, a somewhat narrow definition of terms has been used.

Accelerate.—To give a car a gain in speed, so that each moment sees an increased rate of travel.

Accelerator.—A usual term applied to a pedal-operated throttle-valve.

Accumulator, or storage battery, consists of alternate plates of lead oxide (positive plate) and metallic lead (negative), immersed in a solution of dilute sulphuric acid. If a sufficient current of electricity be passed through this combination of elements, a chemical action is set up. If the accumulator be now connected in a circuit, the chemical reaction will cause a discharge current of electricity to flow.

Armature.—The rotated, or movable, component of the magneto, comprising a central spindle, on which is mounted a core of soft iron plates, surrounded by a considerable length of fine insulated copper wire. The fact of moving the armature round in proximity to the permanent steel magnets results in the generation of an electrical current.

Automatic Air Valve.—An auxiliary valve covering an air port in the carburettor, and usually situated between the jet and the throttle. The object of this valve is to automatically open as the engine speed increases, and admit just so much additional air as is required to maintain a correctly proportioned mixture of petrol and air.

Backfire.—An undesirable and premature igniting of the charge in the cylinder, causing the explosive effect to act on the piston as it ascends, thereby tending to drive the engine backwards. Sometimes it is caused by a derangement in the ignition system, other times by the presence of red-hot carbonaceous deposit inside the cylinder, or, broadly, by overheating.

Backlash.—A looseness of fit, or play, between two parts connected together; wherever wear has taken place, as between meshing gears, universal joints, steering and control rods, &c., it makes itself evident.

Band Brake.—A brake consisting of a flexible metal strap, which can be contracted on to a drum attached to a member the speed of which it is desired to check.

Battery.—A group of two or more cells; the cell meaning any combination of elements capable of either: (1) storing, and subsequently giving off, electrical energy (*see* Accumulator); or (2) merely, on account of their nature, supplying a current.

Bearing.—The part used to support a shaft or spindle and retain it in position.

Benzine.—A distillate from petroleum, similar to naphtha. Can well be used in the carburettor. Do not confuse it with the coal-tar product "Benzene," which latter is closely allied to benzol.

Bevel Gear.—Constitutes (together with the "Worm Gear") about the best method of transmitting power from one direction to another. The faces of the teeth on a bevel wheel are conical.

Big End.—A technical definition of the lower end of the connecting rod, *i.e.,* the one which embraces the crank pin.

Blow-out.—A burst in a pneumatic tyre.

Bore and Stroke.—*Bore:* Is the measure of the diameter of the cylinder of an engine. *Stroke:* Is the length of travel of the piston up and down the cylinder. It is, of course, equivalent to, and governed by, the length of the crank of the main shaft.

Cam.—The small eccentric on the "half-time" shaft. Generally, a cam is a mechanical contrivance for transmitting, from a rotating shaft, an intermittent reciprocating motion.

Carburettor.—The device which brings about the mixing of petrol (or any volatile "hydrocarbon") with a sufficient quantity of air for the conditions ruling.

Cardan Joint.—A device whose function is to translate power between two shafts, which do not lie in the same plane.

Cell.—[*See* "BATTERY."]

Centrifugal Pump.—A very usual form of water pump, used to induce a proper circulation of cooling water.

Change Speed Gear.—[*See text.*]

Chassis.—Denotes the whole of a car, with the exception of body, tyres, and accessories. This is the full meaning; nevertheless, it more often than not is restricted to a reference to the underframe.

Chaffeur.—Lit.: "Stoker."

Circuit.—An inclusive term for the path to which a current of electricity is confined (by suitable insulation). On a car, the steel frame is used as a "return" path for the current after it has served its purpose.

Clutch.—The separable or detachable connection between the engine and the transmission system. Every car with a petrol engine demands a clutch. I have also used the word "dog-clutch." This is quite a separate mechanism from the clutch proper, and means any pair of interlocking members for joining two parts together.

Combustion Chamber, or "head" of the cylinder; that part within which the gas mixture is imprisoned, and compressed, by the piston.

Compression.—The advantage of compressing the charge before firing it is very great, and results in multiplying the value of the explosion. The usual compression in a modern motor is between 75 to 90 lb. per square inch.

Condenser.—An indispensable part of a coil or high-tension magneto. It operates on an intricate principle, and results in maintaining the platinum "contact" points clean and unoxidised.

Conductor.—The insulated path, lead, or wire, for the electrical current to flow along.

Connecting Rod.—The rod which connects the piston to the crank shaft, and translates the reciprocating motion of the former to the circular motion of the latter.

Contact Breaker of the magneto is the mechanism usually placed on the end of the armature shaft, and which is necessary to rupture the primary current at the correct moment, and thereby cause an induced high-tension current in the secondary coil.

Crank.—A lever attached to a shaft, or other rotatable member, which serves the purpose of conveying the revolving effort.

Current.—The flow, or passage, of electricity.

Cycle.—The sequence of operation of a series of functions.

Dashboard.—The partition between the engine plant and the front seats.

Dead Centre.—That position of the crank in relation to the piston, when an explosion on the latter cannot cause a movement of the crank.

Deposit in the cylinders is caused by the coagulation and carbonising (due to the heat of the explosions) of lubricating oil, dirt, and petrol in the combustion chamber.

Differential.—A balancing, or automatically compensating device, explained at length in text.

Distributor.—In the electrical circuit. Serves the purpose of directing when, and in which cylinder (of a multi-cylinder engine), the spark may occur.

Eccentric.—One method of converting rotary motion to reciprocating motion.

Efficiency.—As regards an engine: refers to the relative value of the heat put into it, and the work got out of it. The higher the compression the greater the efficiency. The value of the work of the very best motor-car engine, when revolving at its best speed, is never above 20 per cent. of the value of heat put into it.

The efficiency of the transmission system is not too good. The average gear-box and final bevel drive absorbs between 15 and 20 per cent. of the engine's power.

Explosion in the Carburettor.—"Popping" in the carburettor is due to either a weak mixture, or sometimes derangement of the inlet valve mechanism.

Exhaust Valve.—The valve through which the spent gases can pass away. It should open and close quickly, and provide an ample opening.

Explosions in the Silencer occur either from accumulated unburnt gas being ignited by the entry of a flaming exhaust, or due to wrong adjustment of the ignition gear, whereby the spark occurs in the cylinder so late that the explosion takes place practically when the exhaust valve has begun to open.

Float.—The buoyant component of the carburettor, the function of which is to regulate the supply of petrol passing to the jet.

Flywheel.—The flywheel of a petrol engine has two main duties to perform: (1) to carry the crank shaft round during the intervals between the firing strokes, and (2) to equalise the shock effect of the explosion. The energy it accumulates from each explosion is the energy it dissipates in the first category.

Fuel Consumption.—Varies according to the horse-power of an engine, and, in particular, to the amount of work an engine is called on to do.

Gate-change.—Is that system of change-speed operating gear which is identified with the "Selective" type of gear-box.

Gear Efficiency.—[*See* "EFFICIENCY."]

Gudgeon Pin.—The short round pin introduced diagonally through the piston, linking the connecting rod to the piston.

High-tension Circuit.—With all internal-combustion engines, except such as use low-tension magneto, the current which gives the spark at the plug is confined to the high-tension circuit. This, inclusively, refers to the high-tension coils on the magneto (or induction coil), the insulated cable therefrom, and the "earth" return path, which completes the circuit. For a current to flow there must always be provided a continuous path along which it can travel uninterruptedly.

Horse-power.—It is a very difficult task to rate any motor-car petrol engine as possessing particular horse-power. Its actual effective working power varies at all speeds. This makes it necessary, in rating a petrol engine, to take its normal speed, and base the calculation on that. The catalogued horse-power of the average car is, more or less, the power the engine will develop at somewhere about 1,000 to 1,200 revolutions a minute. The Royal Automobile Club formula for rating engines is based on the diameter or bore, of the cylinders, and is, of course, purely arbitrary.

Ignition.—The modern motor possesses an electrical system, the object of which is to explode the compressed charge by causing a periodical spark in the cylinder. This system is the "Ignition."

Inertia.—Is the propensity of a body, or more correctly its "mass," to resist a force which tends to change either its state of rest or, alternatively, its state of motion. It is the inertia of the flywheel which carries it round against the resistance of the compressed charge. It is the inertia of the car which resists the effort of the brakes pulling it up.

Inlet Pipe and Valve.—The inlet or induction pipe is the pipe connecting the carburettor to the engine, and provides the path for the vapour which passes through the inlet valve, as soon as this is opened, into the cylinder.

Insulation.—On electrical circuits it is necessary, in order to prevent a leakage and dissipation of current, to separate the conductor from surrounding objects by means of insulation. Rubber, glass, vulcanite, air, &c., form a group of the best insulators. Water is an enemy to insulation.

Jet.—The orifice through which the petrol issues, drawn out by the suction of the engine.

Key.—A wheel, or lever, is said to be "keyed" to its parent shaft when it is maintained in place by a slip of metal, which fits a coinciding pair of grooves, one in the wheel, or lever, and the other in the shaft.

Lay Shaft.—The short shaft in the gear-box, which lies parallel to the "through" main shafts.

Litre.—Metric measure of capacity. One litre= a little more than 1¾ pints.

Load.—Commonly used to designate the work the engine has to do, or the resistance it has to overcome.

Lock.—Of the steering. The angular range through which the front wheels can be turned.

Loss of Power.—Arises from poor compression, faults in the action of the valves, maladjustment of carburettor, overheating, faults in ignition, abnormal friction in the transmission, slipping clutch, brakes rubbing and so introducing friction, insufficient lubrication. This is a brief summary only.

Lubrication.—In order to be effective as lubricants the oil used in an engine must be capable of withstanding great heat without carbonising or losing its viscosity.

Metric Equivalents.—One metre=3 ft. 3 in. (approx.); one square metre=11 sq. ft. (approx.); one cubic metre=35⅓ cu. ft. (approx.); one litre=·035 cu. ft. (approx.); one litre=1¾ pints (approx.); one gramme=·035 ozs. (avoirdupois).

Misfire.—Should the engine run irregularly and the charge not be fired consistently, the effect is called "Misfiring."

Mixture.—Refers to the blended air and petrol. If it be either too rich or too poor in petrol, the power of the engine suffers.

Mixing Chamber.—That portion of the carburettor immediately above the jet and below the throttle valve.

Momentum.—The force possessed by a moving body which is only exhibited when any opposing force tries to check its motion.

Muffler.—Synonymous with "Silencer."

Naphtha.—A distillate from petroleum.

Needle Valve.—As colloquially used, refers to the shut-off valve in the carburettor, and is opened and shut, automatically, by the action of the float. (See illustration.)

Neutral position of the gear lever is when the sliding gears, in the change-speed box, are disconnected or out of mesh.

Out of Gear.—[*See* "NEUTRAL POSITION."]

Overheating is caused by a variety of misdemeanours, such as bad lubrication, rich mixture, "racing" the engine, faulty water circulation, choked-up silencer, &c.

Petrol.—Volatile distillates from petroleum of a specific gravity of from ·610 to ·750.

Piston.—That portion of the engine mechanism which reciprocates inside the cylinder and transfers the effect of the explosions to the crank shaft (per the connecting rod).

Piston Ring.—Flat metal rings encircling the piston and making it gas-tight.

Planet Wheels.—Of the differential; so called because of their motion (1) on their own axis, and (2) about the axis of the axle shaft, thus giving them a characteristic of the heavenly bodies.

Radiator.—The reticulated structure, placed either before or behind, the engine, and constituting an efficient device for cooling off the heated water from the cylinder jackets.

Secondary Current.—A current "induced" by a primary current, and caused by the proximity of the secondary coil to the primary, at a time a change of effect is taking place in the latter. It is purely reactive or sympathetic, and, apart from this, is one of the puzzles of the universe.

Side-slip.—A term applied to the undesirable and fortuitous slipping of a car on a bad holding surface. It must be differentiated from "skid," which is caused entirely by injudicious application of the brakes.

Silencer.—In order to absorb the violence of the noise of the exhaust, a device, the silencer, is interposed between the engine exhaust pipe and the atmosphere. It contains a series of baffle plates which, more or less, break up and dissipate the noise of each exhaust.

Skid.—[*See* "SIDE-SLIP."]

Sparking Plug.—[*See text.*]

Speed Gear.—[*See text.*]

Spindle.—The shaft which forms the axis about which a wheel, or other part, revolves.

Spray.—[*See* "JET."]

Steering Wheel.—The meaning is obvious.

Storage Battery.—[*See* "ACCUMULATOR."]

Stroke.—[*See* "BORE AND STROKE."]

Throttle.—The admission valve interposed between the carburettor and the inlet valve pipe, so that the driver can vary the amount of mixture, or gas, passing to the engine.

Transmission.—That part of the mechanism between the engine and the road wheels. An inclusive term for clutch, gear-box, cardan shaft, differential and live axle.

Trembler.—The vibrating spring blade on an induction coil, whose function is to interrupt the primary current during the time the contact is made in the commutator (on an accumulator and coil system of ignition and on one or two magneto systems). Its action is comparable to that of the vibrator of an electric bell.

Universal Joint.—[See "CARDAN JOINT."]

Valve-chamber.—That portion of the combustion chamber which forms a "pocket" above the valve.

Valve-face.—The seating on which the valve closes.

Valve-gear.—Of the engine, the whole mechanism, cam-shaft, tappets, and spring which co-operate to work the valve.

Wheel-base.—The measure of the distance between the centres of the back and front wheels.

Wheel-track, or gauge. The measure of the distance between the paths of the front wheels.

Worm-gearing.—As alternative to the bevel-gearing is increasing in popularity. The teeth on the worm-wheels are of a spiral character, and transmit the power with a sliding thrust.

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BADGER.—The British badger (*Meles meles*) is perhaps, next after the otter, our most interesting mammal. His subterraneous and nocturnal habits of life have brought this quaint beast into the realms of legend and fable to an extent credible only by those who have perused the works of the earlier writers on sport and natural history. Even to-day there are writers who speak of him as belonging to the bear tribe, as some careless naturalists still call the otter an amphibian. The badger is really a weasel, like the otter, his distribution being in the Old World over almost the whole of Europe and Asia, including India and Japan, and in the New throughout North America and Mexico. There are few species of his genus, those beside the common badger being confined to five—the large Siberian badger, the North American *Meles labradorica,* the Mexican badger, the Japanese badger, and *Meles indica,* which has a pig's snout and long tail.

The general appearance of the badger is sufficiently well known to most people, as he is a common object under glass cases in museums and the halls of country inns. His uniform greyish coat and the boldly marked black and white striped face are sufficiently striking, and his skin is in request for the manufacture of the Highland *sporan*, a fact that may account for the comparative scarcity of the species in northern and western Scotland. His chief characteristics are the formidable digging claws with which his forefeet are furnished, and the muscular hams which enable him with his hind legs to bring back and throw behind him the result of his labours as a navvy. He is of plantigrade habit, the only point in which he resembles the bear save that of his fondness for honey. Although a true carnivore, the badger is, more strictly speaking, omnivorous. Not only mice and rats, hedgehogs, worms, beetles, insects, snakes, young rabbits, and small birds are to his taste, but many sorts of vegetation, bracken-roots, and the fruit of the bramble and other berry-bearing plants are included in his dietary. He is also a persistent destroyer of wasps' nests, digging them out, oblivious of the attacks of their owners, and devouring comb and grubs indifferently. He has been accused of egg-stealing, but the evidence is far from conclusive, it being probable that his tracks seen near rifled game nests are due to his habit of lying in wait there for one of his favourite foods, the hedgehog, who undoubtedly does eat eggs. The assertion of some keepers that he is a slayer of fox cubs may be dismissed as merely libellous; but, especially in hard weather, when many sources of food supply are cut off from him, he undoubtedly attacks domestic poultry, the fox getting the blame.

[*Photo. by W. S. Berridge, F.Z.S.*

BADGER.

Badger Setts.—The home of the badger is called a "sett," and he as often as not shares his sett with a fox. Taking a fox-earth or rabbit-burrow, the badger adapts it to his proper needs by tunnelling and chambering it to an almost incredible extent. In so doing he cleanses it, and in this way is useful in preventing the spread of mange. The badger suffers nothing offensive to remain in any earth he may occupy, but removes it to a pit dug for the purpose at a convenient distance from the entrance. Some few huntsmen of foxhounds have asserted that badgers spread mange, but no real evidence of the existence of a mangy badger has yet been produced. Instances of badgers, foxes, and rabbits residing in the same "sett" are very numerous, and an otter has been known to be a fellow-tenant. Badgers and foxes seem to agree well together, and a certain method of persuading the latter to occupy a newly-made covert is the pre-introduction of a pair of badgers.

Chase of the Badger.—Attempts have always been made to force the badger into the position of a sport-giving animal, but with indifferent success. Apart from the now happily obsolete "sport" of baiting him, there are two methods by which it is attempted to show him as a beast of chase. The more sporting of these is to hunt him on a bright moonlight night with dogs capable of overtaking and holding the quarry. The meadows in the neighbourhood of a "sett" are drawn; the dogs—cross-bred bull-terriers are the best for the purpose—giving tongue on starting the badger, who goes off at once for his "sett." Usually he is stopped and held before he can get there, the field coming up in time to despatch or sack him, according as his

BADGER DIGGING. A TERRIER AT CLOSE QUARTERS WITH THE BADGER.

death or capture alive is sought. Sometimes hounds are employed, and a man sent forward to stop the entrances to the setts with sacks furnished with running nooses, wherein "Uncle Brock" entraps himself.

Digging the Badger.—The other method is by digging. A sett having been selected, several working terriers and a sufficiency of sturdy diggers are taken to the place, furnished with an elaborate armoury of spades, grafts, picks, axes, crow-bars, draining-tools, shovels, earth-piercers or locating-rods, and badger-tongs. A terrier is sent into the sett to mark the badger, and when his voice is heard in earnest remonstrance with his enemy at the latter's attempt to dig himself further into the earth, the spot is located by listening, and a trench cut from above to intersect the line of the badger's retreat. On emerging unexpectedly into daylight, the badger is seized with the tongs and promptly sacked for removal to some locality where his presence is more urgently required. Badger-digging possesses an extraordinary fascination for some sportsmen, though it does not appeal to the bulk of hunting men. It affords, however, an undoubted test of the gameness, skill, power of endurance, and staunchness of the terriers. A good working terrier, when once he has marked his badger, should never leave him, nor ever cease barking, until want of fresh air and water compels him to come to the surface, when another should be instantly sent in, or the badger will have buried himself beyond recovery. A terrier should not attack the badger except in rear, when he is trying to dig himself in, but should retreat, still barking, before the badger's rushes, and in this way hold him in play while the men with spades are cutting off his retreat. Sometimes it is possible to dig out a badger in half an hour, but more often it takes from six hours to twelve, and there are records of digs having lasted for three days, leaving the badgers finally victorious. Thanks to the efforts of the badger-digging clubs that have been formed of late years, badgers are now more numerous and more widely distributed than they were during last century, and there are few parts of the United Kingdom in which they may not be found. Indeed, many are killed during each cubbing season by the foxhound packs. The record weight of a badger taken by digging is 37 lbs. The sows frequently weigh more than the boars, the average weight being, probably, boars from 25 lb. to 30 lb., sows from 22 lb. to 28 lb. The proper season for badger digging is from August to October, and again from January to the end of February, as the sow litters down in the spring, being supposed to possess, in common with the roe doe, the faculty known as suspended gestation. Instances of albinism are fairly common, but melanism in badgers is unknown. There are in the Zoological

Badger Digging. Waiting to Tail the Badger.

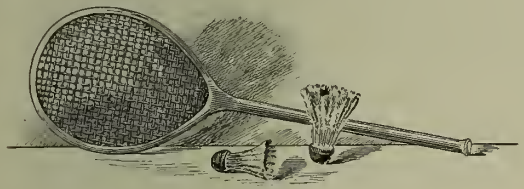
Gardens in London two badgers, male and female, in which the usual grey colouring is replaced by pale cinnamon, while the eyes are of a dark claret hue. These specimens were, curiously enough, captured within a month of each other in Warwickshire and Rutlandshire respectively. They have not yet (1910) interbred.

L. C. R. CAMERON.

BADMINTON. — The game of **Badminton** is played in a Court forty-four feet long by twenty wide. The **net**, which ought to be as light as possible, and made with a small mesh, should be stretched for twenty feet across the centre of the court, and should not be less than eighteen inches deep. Its lower edge should be five feet from the ground, and as taut as possible.

The Badminton **bat** should not be more than five ounces in weight. The **shuttlecock** should weigh about a quarter of an ounce. The small shuttlecock used by many clubs weighs considerably less than a quarter of an ounce. This small shuttlecock is slower in flight, and the rallies are consequently longer and the game generally easier.

Badminton is best played in a well-lighted room or hall, where the wind cannot affect the flight of the shuttlecock. It can be played very well with the larger shuttlecock in the open air on a calm day. The game is often played with three or four players on a side. This is not, however, the scientific game; for with more than two on a side the players in front cannot help getting in the way of their partners behind.

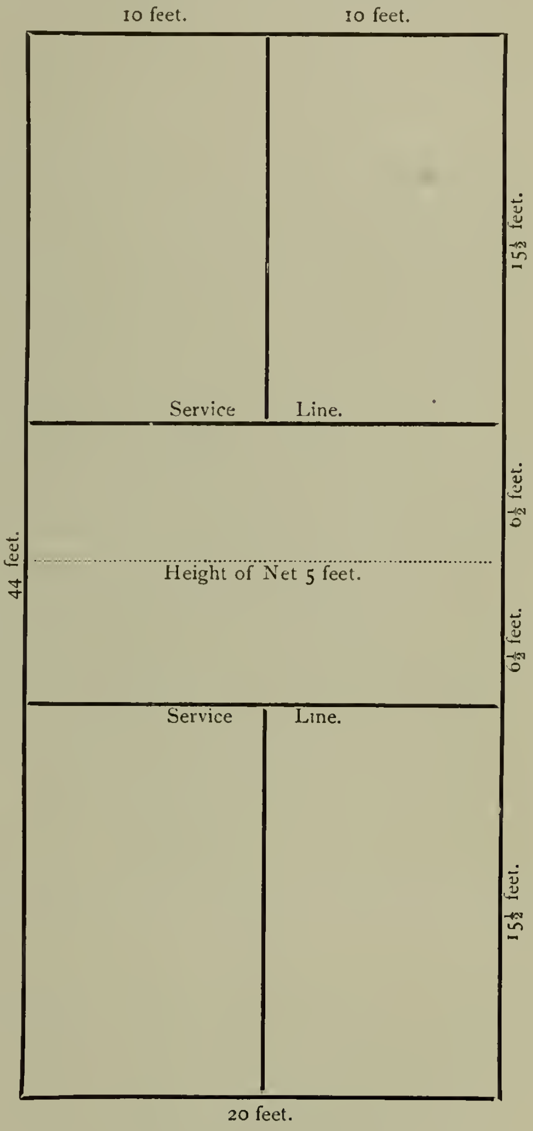


The **Service lines** are drawn across the court parallel with the net, and six and a half feet on each side of it. A line down the centre, joining the service lines and baselines, forms the four courts.

The **game** is fifteen for one or two players on a side, twenty-one for three players, and twenty-eight for four players on a side.

In beginning a game with two players on each side, the side that goes in first is only allowed one hand in, but after the first round the partners go in one after the other.

In **Serving**, the striker must stand behind the service line, and hit the shuttlecock so as to give it an upward trajectory, and send it over the opposite service line into the opposite diagonal court. There are no faults allowed in serving as in lawn-tennis. Only the player in the diagonally opposite court can take the serve. After the serve, the players can go as near the net as they like, and send the shuttlecock anywhere within the courts, provided it goes over the net and between the poles. If the shuttlecock touches the net in going over, it does not invalidate the stroke, but the striker must not touch the net with his bat.



Scale ⅛ inch to a foot.

If the striker send the shuttlecock into or under the net, or outside the courts, it scores against him. If his side be in, the hand goes out; if the other side be in, it scores an ace. If the shuttlecock touch the ground within the opposite courts, or touch the dress or person of a player, the striker scores an ace if his side be in; if the other side be in, their hand goes out.

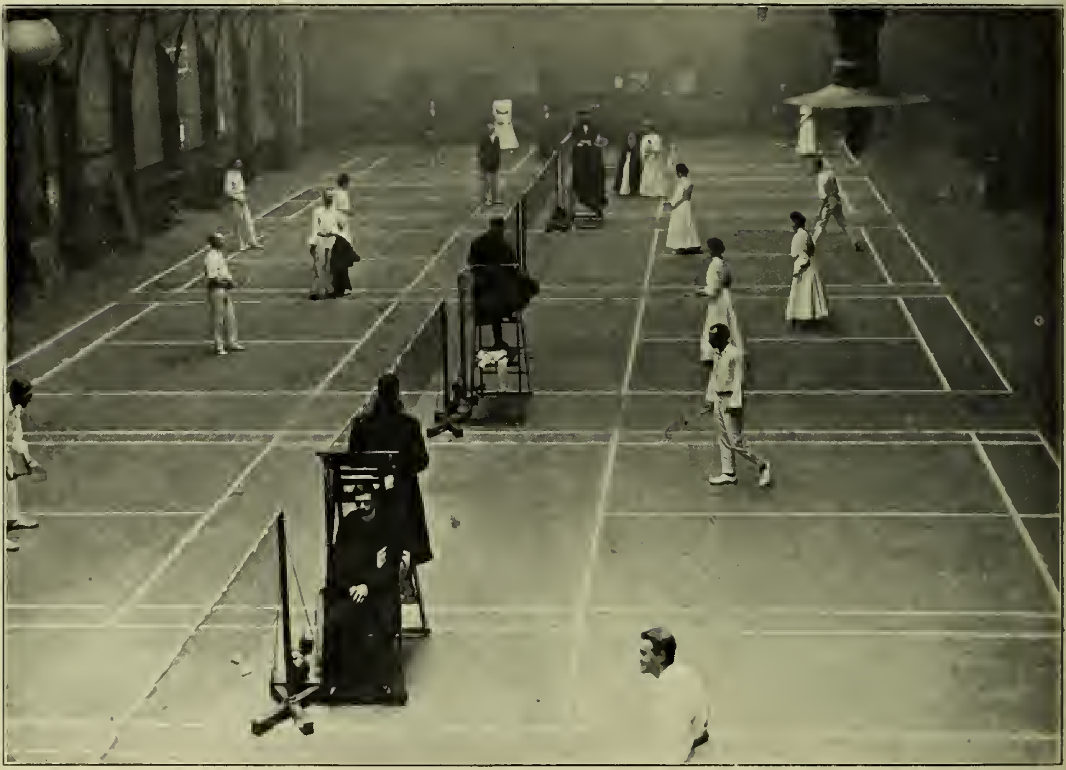
Whenever an ace is scored, the server changes courts. When the score stands thirteen all, they set five; when fourteen all, they set three. They begin counting again, and the side which first scores five or three wins. The sides cross over when the score has reached eight.

Badminton is a quicker game than lawn-tennis. The courts being smaller, there is not so much running about, but there is more hard hitting, and the exercise to the arm is greater.

It is a great advantage to put the server out at the first stroke, to prevent his side scoring. The policy of the server is to send the shuttlecock high, so that it may drop as perpendicularly as possible into the farthest corner of the diagonal court, and thus make it difficult for the adversary to cut it down and kill it. It is generally good play to keep sending the shuttlecock high at the back of the adversary's court until an opportunity comes to cut it down and kill it. In cutting down the striker should try not to send it within reach of the adversary. When the shuttlecock is being driven hard backward and forward, an ace is often secured by suddenly altering the pace and dropping the shuttlecock just over the net.

In playing **singles,** the player who gets command of the shuttlecock, and is thus able to send it at each stroke far from the adversary, has a great advantage. In such a case, unless the last ace in the game is in question, it is *better deliberately to lose the ace* than to continue playing at such a disadvantage. As an illustration, the writer saw a very good lady-player lose an important match in this way to a skilful adversary. It was towards the close of a severe contest that the lady was forced by her antagonist to run across the courts at every stroke. She ran so well that she must have covered nearly fifty yards before she failed at last to return the shuttlecock. The effort was so great that she was quite exhausted, and the lady opposed to her made the two or three aces necessary to win the match with the greatest ease.

Badminton is a game of science and strength. The quickest and most active player is almost sure to win, but he must also possess that instinct which enables him



Badminton Association Tournament. All-England Championships.

in the heat of a rally to decide in a moment where to place the shuttlecock so as to be in the most difficult position for the adversary to reach it.

Badminton, at first played only at Bath, Cheltenham, and other places where retired Indians congregate, is now widely known. Clubs are formed all over the country. The game has stood the test of time, is more popular than ever, and will doubtless continue to flourish.

ARTHUR SOUTHEY.

BADMINTON IN INDIA is ordinarily played in a ground the size of a double lawn-tennis court (78 ft. by 36 ft.), with five players a-side. Instead of the usual shuttlecock, most players prefer a ball of Berlin wool wound on a double disc of cardboard 2¼ inches in diameter, with a central hole of 1 in. The ball flies more quickly than the shuttlecock. When missed by one player, it is not considered dead until it has touched the net or ground, or been taken in hand, but may be returned by any other player, or players, on the same side.

GLOSSARY.

Ace.—The unit of scoring.

Base-lines.—The lines parallel with the net, which limit the ground at the extremity of the courts.

Court.—The ground, a rectangle measuring 44 ft. by 20 ft., is marked out into five divisions. The service-lines are parallel to, and on either side of the net. The spaces between the service-lines and base-lines are subdivided into right and left courts [*v.* diagram].

Fault.—An attempted service or return, which either fails to clear the net, or pitches outside the proper court.

Game.—This consists of 15 points for 2 players a-side, 21 for 3 a-side, or more.

Hand-in.—The player who serves.

Hand-out.—The server or striker is out when the shuttlecock does not clear the net, or when it does not reach the proper court or drops beyond the boundary-lines.

Net.—This is slung across the shorter transverse of the courts, midway between the base-lines. It should be between 5 ft. and 5 ft. 1 in. in height. It is a light, small-meshed net.

Points.—The units of scoring. A point is scored when the opponents fail to return the shuttlecock, or when they send it out of the courts.

Racquet.—Must not exceed 5 oz., and is strung with cat-gut.

Service.—The opening stroke of a round, the server standing in one court between the service- and base-lines and driving the shuttlecock in a rising trajectory, so that it would pitch, if allowed, in the court *diagonally* opposite him.

Service-lines.—Lines drawn across the ground parallel with the net and 6½ ft. on either side of it.

Shuttlecock.—The missile employed, which consists of a cork crowned with feathers, from 3 to 5 in. in length. In weight, about ¼ oz.

BADMINTON.

THE LAWS OF BADMINTON.

THE COURTS.

1. The courts are laid out as in the diagram on p. 195, and defined by white or black painted or chalk lines 1½ in. wide.

2. The net should be made of fine tanned cotton cord to a ¾ in. square mesh, 16 ft. in length, 2 ft. 6 in. in depth, 5 ft. in height at the centre, and 5 ft. 1 in. at the posts. The top of the net should be edged with a 3-in. white tape, doubled and supported by a cord run through the tape.

3. The posts should be sufficiently firm to keep the net strained as above, and should project at least 6 ft. above the level of the net.

4. The shuttlecocks to weigh from 65 to 75 grains, to have 16 to 18 feathers fixed in a cork 1 in. in diameter, feathers to be 2½ in. long, to have 2¼ in. spread at the top, and to be tied in with thread one inch above the mark.

THE GAME.

5. The game is played by one or two players a-side.

6. *The Choice of Courts.*—The choice of sides and the right of serving during the first game shall be decided by toss: provided that if the winner of the toss choose the right to serve, the other player shall have the choice of sides, and *vice versa*; and provided that the winner of the toss may, if he prefer it, require the other player to make the first choice; but the side winning a game is bound to begin the next. Either player on the winning side may begin the next game.

7. The game consists of 15 aces; at 13 all, the side which first reached 13 has the option of setting 5, at 14 all, of setting 3.

8. The rubber is the best of three games if the third game is played, the sides cross over when the leading score reaches eight.

9. A fault made by a player whose side is "in" puts a hand out; if made by a player whose side is "out," it counts an ace to the "in" side.

10. It is a fault—

(*a*) If the service is overhand. (A service shall be deemed to be overhand within the meaning of this rule, if the shuttle at the instant of being struck be higher than the server's waist.)

(*b*) When the service falls into the wrong court (*i.e.,* not into the one diagonally opposite to the server), or falls short of the short service-line, or beyond the long service-line, or outside the boundary lines.

(*c*) Unless the server's feet are in his own court.

Note.—A foot on the line has been ruled to be out of court.

(*d*) If, either in service or play, the shuttlecock falls outside the bounds of the game, or does not pass between the posts, or the vertical lines above them, or passes through or under the net, or touches the roof or side walls, or the person or dress of any player.

Note.—A shuttlecock falling on any line is held to have fallen in the court of which such line is a boundary.

(*e*) If the shuttlecock be struck before it crosses the striker's side of the net, but the striker may follow the shuttle over the net with his racket.

(*f*) If, while the shuttle is in play, a player touches the net or its supports with racket or person.

(*g*) If the shuttlecock be hit twice by the same player, or be hit by a player and his partner.

(*h*) If a player serves out of his proper turn, or from the wrong court, provided that such fault be claimed and allowed before the next succeeding serve is returned.

The Play.

11. It having been decided which side is to have the first hand, the player in the right-hand court of that side commences the game by serving to the player in the adverse right-hand court. If that player return the shuttlecock before it touches the ground, it must be hit back by one of the "in" side, and then returned by the "out" side, till a fault is made or the shuttlecock touches the ground. If a fault is made by the "in" side, the server's hand is out, and the player in the right-hand adverse court now becomes the server; but if the service is not taken, or the fault is made by the "out" side, the "in" side score an ace. The "in" side then change courts, the server now being in the left court and serving to the adverse left court. The game is continued in this manner, serves being made alternatively from each court into the one diagonally opposite, and courts being changed by the players on each side when, and only when, an ace is added to the respective scores. The first serve of a side in each innings shall be made from the right-hand court. The service-lines are disregarded after the service is taken.

General Rules.

12. The person served to may alone take the serve, and no player may take two consecutive serves.

13. The server may not serve till his opponent is ready, but if a return of the service be attempted the latter shall be deemed to be ready. If, in delivering the serve, the server makes preliminary feints, or otherwise baulks his opponent, the latter shall not be bound to take the service.

14. The side beginning a game has only one hand in its first innings.

15. The server may stand anywhere he likes in his own court, between the short- and long-service-lines.

16. If the shuttlecock touches the net or posts in service it is a let, but if in play it does not invalidate the stroke.

17. A "let" may be given by the umpire for any unforeseen or accidental hindrance, on appeal from either player before the next service, when the ace will be replayed.

18. The decision of the umpire is final, whether it is right or whether it is wrong.

Appendix.

In games of one player on each side, the above rules hold good, except that, notwithstanding Rules 11 and 12, both players change courts after each ace is scored, and consecutive serves are taken by the same player.

The game of Badminton may also be played by three or four players a side; in this case the game consists of 21 aces. At 19 all, the side which first reached that number has the option of setting 5; at 20 all, of setting 3.

The back boundary line of the court may become the long-service line, and the back player can take the service after it has passed the front player.

The side beginning a game has only two hands in its first innings. In every subsequent innings, each partner of a side has a hand, the first player of the "in" side, after the second hand is out, changing places with the third player, and similarly the second player changing places with the fourth player after the third hand is out.

Bibliography.—*The Official Edition of the Laws of Badminton and the Rules of the Badminton Association,* from 1898, in progress (H. Cox).

BANDY—Bandy, or Hockey on the Ice, is a similar game to hockey on the land. It is played by skaters upon broad sheets of ice between goals, with curved sticks called "bandies," and a ball or "cat."

Teams.—The players are divided into two parties or teams, and the object of each set of players is to drive the ball through the goal of their opponents.

Ground.—A large piece of ice is needed for playing the game satisfactorily. The smallest ground allowed by the rules is 100 yards by 50 yards, and that only when a larger cannot be obtained. The ground should be *quite free from snow,* as even a thin layer spoils the game, and the snow should be swept off at once before it has time to harden.

Goals.—The goals consist of two upright posts, 12 feet apart.

Number of Players.—The players are eleven a side, but if the field is smaller than 100 yards by 50 yards it is better to reduce their number; thus, six a side make a good game on a field of 75 yards by 35 yards.

The Bandy.—The bandy used is a curved ash stick of about 1½ inches diameter and 3½ feet long. It is very similar to the stick used in hockey on land, except that the blade is not so curved, and is not, as in that game, rounded on one side, but has both sides flat.

The Cat.—The "cat" used is an india-rubber ball, about the size of a lawn-tennis ball. With such tools on a surface like ice tremendous hits might be given. To discourage this, and also to prevent accidents, the bandy in hitting *may not be raised above the shoulder.*

The Game.—The rules of the game are in general the same as those of hockey on land, the rules of offside being the same as in Association football. There is, however, no rule that all hits must be made on one side of the bandy, or from the right hand; and, in fact, in dribbling the player keeps the ball well in front of him, pushing it forward, now with one side of the bandy now with the other, and often changing hands when dodging an opponent. The teams are ranged in the field much the same as in hockey and football, there being a goalkeeper, backs, half-backs, and forwards; and a combined game of passing across the ground is found effective, especially upon smaller grounds. On larger grounds the dribbling is a special feature of the game, and is far more brilliant and effective than in the games above mentioned. The skilful player can run with the ball in front of him at very nearly his full speed, perhaps at the rate of from twelve to fourteen miles an hour, or even more, and can, almost without slackening his pace, dodge and elude a single player coming forward to "tackle" him; while it is almost impossible for the player when passed to turn round and catch him up again. The way in which a fast and skilful player will sometimes thread his course with the ball through his opponents is astonishing. These facts, and the rapidity with which the ball travels when hit, make the game exceedingly rapid and exciting, and of keenest interest to players and onlookers; and it would doubtless become very popular but for the very limited number of days in the year upon which it can be played, the difficulty of finding a suitable ground, and the necessary uncertainty which attends every fixture, even when made only two or three days ahead, from the changes in the weather.

The game has been described as played in accordance with the rules of the *National Bandy Association*, which are given below. But where the field of ice is very small a plain cork bung, covered with leather or bound with string, may be used with advantage; and in some places the thin hockey-stick with bent end of about six inches, formerly used by the Virginia Water and other clubs, is still preferred. On the artificial ice at the Ice Palace (Regent Street), where the space was of course extremely limited, a fairly good game was obtained by using a flat india-ruber disc (3 inches diam. by 1 inch thick) as the cat, and by prohibiting the bandy when used in hitting from being raised from the ice.

The kinds of skates used in the game are various. The members of the *Bury Fen Club* use ordinary "fen runners" (wooden with flat blades), and by preference the "Standard" skates (marked "S. B." with crossed bandies), but the Virginia Water players, and many others outside the fens, use one or other of the varieties of figure-skates with curved blades.

A General View of Bandy. Sweden v. Finland.

The game, played with the restrictions imposed by the rules against high hitting, tripping, charging, &c., is both safe and delightful; and the writer, after considerable experience, hardly remembers a serious accident occurring. But if played in rude and unrestricted fashion, and in an ill-natured spirit, it becomes dangerous. A great advantage is that it is played with enjoyment and success by men of middle age, and also by ladies, among themselves. The game has for some years been played by ladies on private pieces of water. Ladies should, however, use thinner bandies and a lighter ball than those above mentioned. A lawn-tennis or a string ball is suitable.

Among the principal bandy clubs are the *Bury Fen* B.C., who play on Bury Fen, at Earith (Hunts.); the *Virginia Water* B.C., who play on Englemere, near Ascot; the *Winchester* B.C., on Winnall meadows near that city; the *Camberley* club, on the "Staff" lake, and the *Northampton* B.C. Mr. Bryant's lake at Stoke Poges, and the Duke of Marlborough's lake at Blenheim are also fine bandy grounds. The game was introduced in 1890-91 into Holland, and there are clubs at Haarlem, Amsterdam, and other places. In 1894 Mr. C. G. Tebbutt introduced it into Norway. It is also regularly played in the season at Davos Platz, and at St. Moritz in Switzerland by the English visitors. Further information may be obtained from Mr. A. Tebbutt, Claramond, Winchester, hon. sec., *pro. tem.*, of the Bandy Association.

ARNOLD TEBBUTT.

GLOSSARY.

Ball.—Of solid indiarubber, diameter between 2¼ and 2¾ in. Usually red.

Bandy.—The club from which the game is named. Shaped like a hockey-stick, only with the blade flat on both sides. Length along the outer curve, not more than 4 ft. Width, not exceeding 2 in. at any point.

Corner-hit.—A free hit, given to one side from the corner next their opponents' goal.

Dribbling.—Pushing the ball along with the flat of the bandy, as opposed to hitting.

Goal.—(1) Two posts 12 ft. apart, connected by a tape or lath 7 ft. above the surface of the ice. (2) The scoring unit, obtained by driving the ball through the posts.

Ground.—A rectangular sheet of ice, measuring not more than 200 yds. by 100 yds., and not less than 100 by 50.

Offside.—Same as in Association Football.

Team.—Eleven players on each side.

Time.—Usually one hour and a half for each match.

RULES OF PLAY.

1. A bandy team shall consist of eleven players.

2. The ground shall be a right-angled parallelogram, 200 yards long by 100 wide; but when it is not possible to provide so large a ground it may be reduced, and also the number of players, by mutual agreement, provided that the ground be not less than 100 yards by 50 yards. The longer sides to be called *side lines* and the shorter lines *goal lines.* A line, or mark, parallel to, and equidistant from, the goal lines shall be called the *centre line.* (The usual and best size for play is 150 yards by 100 yards.)

3. The bandy shall be of wood, not exceeding 2 in. in width in any part, or 4 ft. in length as measured along the handle and round the curve; and shall have no metal fittings or sharp edges.

4. Players must wear the colours of their side on the playing arm or bandy.

5. The ball shall be of solid indiarubber, not less than 2¼ in., nor more than 2¾ in. in diameter. It is desirable to have it coloured red, and to be the present lacrosse ball.

6. The goals shall be in the centre of the goal lines, and consist of two uprights or goal posts 12 ft. apart, connected by a horizontal tape or lath 7 ft. from the ice.

7. The choice of goals shall be tossed for at the beginning of the game; and at half-time, and then only, the teams shall change ends. The time during which a match is to last shall be agreed upon beforehand by the captains, the recognised time for play being one and a half hours.

8. To start the game, and after each goal is made, each team being on its own side of the centre line, play shall be commenced by the referee or one of the umpires throwing up the ball perpendicularly in the air from the centre of the ground, and when the ball has reached the ice it shall be in play.

9. A goal is scored when the ball has passed between the goal-posts or under the tape or lath.

10. When a player touches the ball, any player of the same side who at that moment is nearer his opponents' goal-line is offside, and may not touch the ball himself, nor in any way whatever prevent any other player from doing so, until it has been touched by another player; unless there are at least three of his opponents nearer their own goal-line. No player can be offside when within his own half of the ground.

11. Whilst the ball is in play, and when a player strikes at the ball, his bandy may not during any part of the stroke rise above his shoulder.

12. The ball may be stopped with any part of the body or bandy, but not with the hand on the ice, except in the case of the goal-keeper; nor must it be picked up, carried, kicked, thrown, or knocked on, except with the bandy. No charging, kicking, collaring, shinning, tripping, throwing the bandy, or rough play shall be allowed. Fencing or hooking bandies shall not be allowed.

13. On the occasion of a free hit, no member of the offending team shall be within five yards of the spot where such hit is made, but he shall not be compelled to go behind his own goal-line. A goal cannot be scored from a free hit, unless the ball first touches another player.

14. On the occasion of a free hit, a corner hit, or when the ball is hit off from a goal line, or thrown from a side-line, the striker or thrower shall not touch the ball again until it has been touched by another player.

15. When the ball has passed the side-line, it shall be immediately struck or hit in from where it crossed the line, in any direction, except forward, by one of the opposite team to that of the player who last touched it. No other player shall be within five yards of the side-line.

16. If the ball is passed beyond the defenders' goal-line, but not through the goal, by the attacking team, it shall be hit out into play by one of the defenders, from any point on the goal-line within ten yards of the nearest goal-post, and on that side crossed by the ball, the attacking side being at least twenty-five yards from the said goal-line. But if the ball has been last touched by one of the defending team before crossing the goal-line, a player of the attacking team shall have a free hit from any point on the side-line within a yard of the nearest corner; and at the moment of such hit, all the defenders must be behind their own goal-line.

17. The penalty for any breach of these rules shall be a free hit by one of the opposite team, from the spot where the rule is broken.

18. Two umpires and a referee should be appointed, each captain appointing one umpire, and the umpires so appointed choosing the referee.

When there are only two umpires and no referee, each umpire shall act in one half of the ground as divided by the centre-line, and give decisions only in that half. The two umpires shall not cross over at half-time. In case of umpires disputing, the decision of the referee shall be final. In case there is only one umpire, his decision shall be final. Should there be no umpire, or umpires, the captains shall be arbitrators in all disputes.

19. A match is won by the team which scores the greater number of goals.

20. In the event of an appeal for any supposed infringement of the rules, the ball shall be in play until a decision has been given.

21. The referee shall have power to stop the game for such time as he may think fit, whenever he may deem it necessary to do so; and he shall deduct any time which he considers has been wasted, owing either to an accident or other cause.

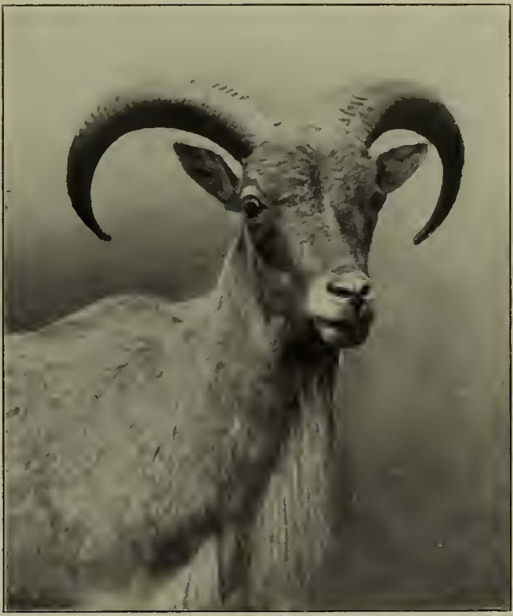
22. In the event of any temporary suspension of the play from any cause, the ball not having gone beyond the side-line, or behind the goal-line, the game shall be restarted by the referee throwing up the ball at the spot where the play was suspended; and when the ball has reached the ice, it shall be in play.

[NOTE.—"Touching" in these rules means touching the person or bandy.]

BARBARY SHEEP.—This fine wild sheep (*Ovis lervia*) is known to the Arabs of North Africa, from Morocco to Tunisia, as the *Udad*, in southern Algeria its native name is *Arni*, and in Tripoli and Fezzan *Wadan*. A good Barbary sheep will stand at the shoulder from 3 ft. 3 in. to 3 ft. 6 in., and the rams are very stoutly built. The general colouration is a russet or chestnut-grey. Both sexes carry a fringe of long hair on the throat, chest, and fore-limbs, but the males are especially remarkable for the masses of hair found on these parts. The tail is longish, and carries a fringe of long hair towards the extremity. The horns are stout, slightly annulated, and have a backward and downward curve. The ewes carry somewhat heavier and bigger horns than are ordinarily noticed among the females of wild sheep. The horns of old rams are usually much worn, and the ridging or annulation will be found to have almost vanished. A good pair of horns of this wild sheep measure about 25 inches over the curve; but exceptionally fine heads reach 27, 28, and 29 ins., and the record, a head in the possession of Mr. Julius Jeppe, procured in Algeria, attains no less than 33¼ ins. over the outer curve.

The habitat of the Barbary sheep is a wide one. Found in the mountains of western and central Morocco, chiefly in the Atlas mountain region, or its spurs, its range extends through Algeria to Southern Tunisia and Tripoli. It is reported from most of the mountain regions of the Sahara Desert, and is found among the ranges of Nubia. It has become known within the last few years that this sheep is to be met with in suitable localities through the Egyptian Soudan nearly as far south as Khartoum—actually up to some hill country within fifty miles north of that city.

Despite its high withers and heavy shape, the *Udad* is an extremely active beast, and, possessing the wary habits characteristic of all wild sheep, it affords excellent stalking. Its rufous-yellow coat, worn alike by the males, females, and young, blending as it does admirably with the mountain region in which it is found, renders this sheep somewhat difficult of discovery, even by the keenest native eye; and excellent glasses and extreme care and precaution are needed by the sportsman who wishes to procure the horns of this species. The sheep run in small troops or family parties. In the hill country, which they make their own, they are extraordinarily active and sure-footed; on more level ground they run with huge bounds at a great pace. The mountains among which the *Udad* range are for the most part in desert country, where water is scarce. The Barbary sheep is, however, one of the thirst-resisting animals of Africa, and can exist for several days—natives say for four or five days together—without drinking. The flesh of young Barbary sheep is fairly good eating, that of the old rams by no means palatable. In Algeria, owing to recent game legislation by the French Government, the *Udad* is not now



[*Photo. by W. P. Dando, F.Z.S.*

BARBARY SHEEP.

so accessible to British gunners as was formerly the case. In Southern Tunisia, however, as well as in the mountain regions of Egypt and the Soudan, fair sport is to be obtained with these animals. Tripoli is little-known ground to the European hunter; but a visit to the interior of this region would be likely to yield fair results with these sheep. Morocco, owing to the recent French occupation of coast towns, is not now very accessible to European gunners. As these troubles disappear, however, and the interior becomes more settled, the wandering sportsman ought to be able to find good sport with these fine wild sheep, more especially in the country fifty or sixty miles inland from Mogador. The Moors are keen sportsmen, but it will be found necessary to procure the friendship of local chiefs before attempting to shoot in that country.

H. A. BRYDEN.

BARBEL (*Barbus vulgaris*).— [*See* ANGLING (COARSE FISH).]

MEASUREMENTS, &c.—Length of head, 4 to 4¾, of caudal fin 4¾, height of body 5 to 6 times in the total length. *Eyes*—rather high up, situated in the middle of the length of the head, 8 to 10 diameters in the length of the head, 3 to 4½ diameters from the end of the snout, and 3 to 4 apart. Dorsal profile more convex than that of the abdomen, which is almost horizontal. Snout produced and somewhat overhanging the jaws, the maxilla much longer than the mandible. Lips thick. *Barbels*—two thick pairs, the maxiliary ones extending to beneath the middle of the eye, while the rostral pair are somewhat shorter. *Teeth*—*pharyngeal*, curved, hooked at their extremity and pointed, 4, 3, 2, 2, 1, 3, 4. *Fins*—dorsal commences about midway between the angle of the mouth and the base of the caudal fin, the extent of its base ¼ shorter than the third undivided dorsal ray, which is the longest, osseous, strong, and serrated along its posterior margin: last ray of the fin half the height of the longest anteriorly. Pectoral inserted low down, broad, and about four-fifths as long as the head, but not reaching the ventrals, which latter do not extend to the anal. Anal narrow, the length of its base being only two-fifths of its height. Caudal deeply forked. *Scales*—about thirty-five rows anterior to the base of the dorsal fin, and seven between the later-line and the base of the ventral. *Lateral-line*—complete, continued to the base of the caudal fin. *Gill-rakers*—short. *Colours*—olivaceous, shot with gold, lightest along the sides and lower surface. Dorsal fin with a narrow, dark outer edge. The other fins of a reddish colour.

BARRACOUTA (*Thyrsites*).—A name locally applied to more than one family of sea-fish. The finest species, both for sport and food, is found in the waters round Tasmania, where it is caught from a boat up to a weight of 10 lb. with what is called the "Maori-jig," a simple tackle consisting only of a piece of red wood pierced by a tent nail. The boat is kept in motion and the fish, which seize the bait greedily, are jerked on board by means of a short, stout rod and line.

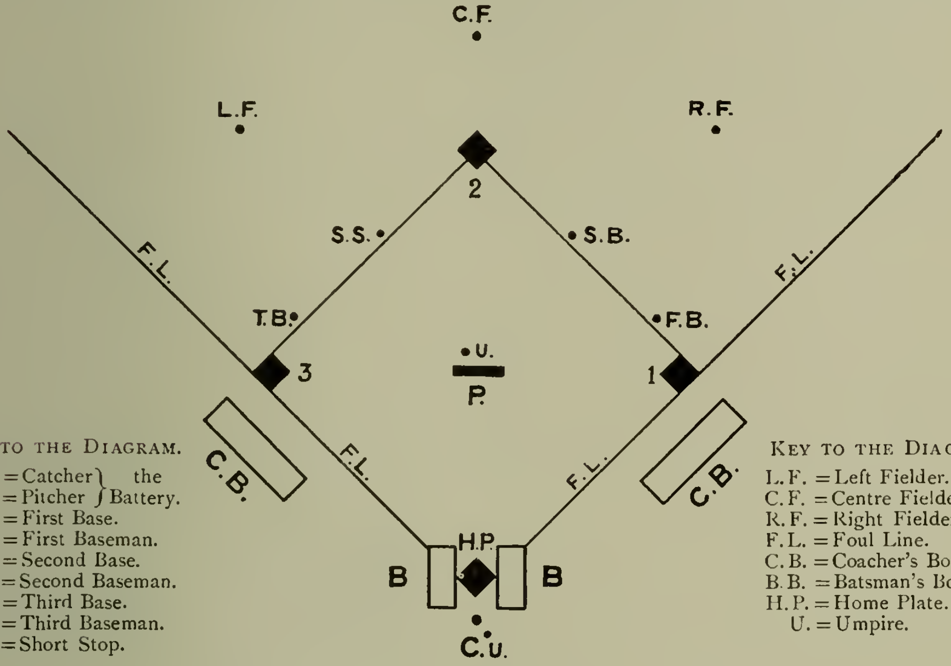
BASEBALL.—Many writers, when chronicling the merits of their own particular sport, seem to consider they cannot do it justice unless they prove by arguments, more or less convincing, that it dates from almost prehistoric times. Baseball, I may say at once, does not belong to Ancient History. What matters if whether the game originated in the days of Alfred the Great or simply dates its birth somewhere in the last half century? If the skill and science of the pastime appeal to the athlete, what does it matter for its antiquity? I may frankly admit then that Baseball, as Baseball, is not yet half a century old.

Similarity to Rounders.—An Englishman, witnessing the game for the first time, will immediately exclaim, "Why, this is nothing but Rounders!" To a great extent the Englishman is right. Baseball is Rounders made scientific. Using Rounders for their groundwork, our brothers on the other side of the Atlantic started to build the edifice of America's national game. Rules and regulations were made to govern the game. Each year saw something added, something amended. The rough edges were hewn off, the rough surface in time was polished. Useless rules were abolished and useful ones evolved. The result has been that Baseball can now take its stand amidst the finest forms of athletics and its followers can boast of as much skill and science in their pursuit of the game as do the devotees of Football or Cricket in the better known winter and summer sports at home.

The Theory of the Game.—Eighteen players are required for a Baseball match, nine on each side. The aim of each team is the same as in Cricket—viz., to make as many runs as possible. To score a run a player must make a complete circuit of the bases, but not necessarily on one hit. For instance, with his own hit he may only get as far as first base. He may get to second base whilst the pitcher (the equivalent of the bowler in Cricket) is delivering a ball to the succeeding batsman. Third base may be reached on the hit of the batsman; and he may reach home plate on a hit by batsman number three. So he would score a run. There are other methods, of course, of getting from base to base, but the above will suffice for an example.

The captain of the home team has choice of innings. To the cricketer such a proceeding would seem to give the visiting team the worst of the bargain. Did the game take as long to decide as Cricket, the argument might hold good; but, as a Baseball match as a rule does not last more than two hours and a half at the most, it would be hard to say that either side is unduly favoured. One team takes the field, and the members of the other take their turn at the bat in regular order. When three men are put out the innings is finished, and the other team then takes its turn with the bat. The game consists of nine innings for each side, and the team having the greatest number of runs at the finish wins.

To Lay Out the Baseball Field.—The simplest method of marking out a Baseball field is as follows:—Procure a heavy cord one hundred and eighty feet in length. In it tie three knots, one at sixty feet five inches, another at ninety feet, and a third at one hundred and twenty-seven feet four inches. When you have found the most suitable position for the home-base, more commonly called the home-plate, drive a peg in the ground and attach the line to it. Carry the line straight out in the direction in which you intend to bat, and knot number three will give you the position of second base. Great care must be taken that the cord be quite taut and absolutely straight from the peg at the home-plate to the centre of the second base. Whilst the cord is so held, the knot at sixty feet five inches will mark the centre of the pitcher's plate. Let one end of the cord be held at the home-plate, the other at second base, and let someone holding the knot at ninety feet, which, of course, is the exact centre of the cord, walk out with it to the corner of the diamond where first base is to be situated, and when the line cannot be carried further without bringing it away from the home-plate or second base, there fix your first base. Repeat this in the opposite direction and mark third base, and there you have your diamond complete. Herewith is appended a diagram of a Baseball field showing the positions of the fielders, the foul lines, bases, &c.



KEY TO THE DIAGRAM.

C. = Catcher } the
P. = Pitcher } Battery.
1. = First Base.
F.B. = First Baseman.
2. = Second Base.
S.B. = Second Baseman.
3. = Third Base.
T.B. = Third Baseman.
S.S. = Short Stop.

KEY TO THE DIAGRAM.

L.F. = Left Fielder.
C.F. = Centre Fielder.
R.F. = Right Fielder.
F.L. = Foul Line.
C.B. = Coacher's Box.
B.B. = Batsman's Box.
H.P. = Home Plate.
U. = Umpire.

PLAN OF GROUND.

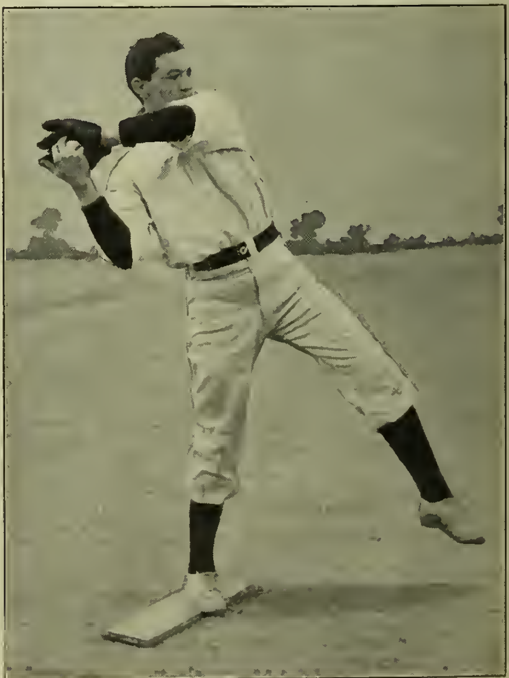
Duties and Qualifications of Players.—The Pitcher.—The pitcher is in Baseball what the bowler is in Cricket, and consequently his first qualification must be a thorough command of the ball. It is true that speed counts for a good deal in both games, but speed is practically useless if eight out of ten balls are sent to the bats-

Pitcher's Delivery for an In-Curve.

men in such a fashion that they can never be effective. The pitcher is not allowed a run, as is the bowler, preparatory to delivering the ball; but apart from that, his deliveries are practically untrammelled. He may pitch, throw, jerk, or hurl the ball provided he does it in such a way that the ball pass over the home-plate not higher than the batsman's shoulder nor lower than his knee. His aim is to deliver three balls answering the above description in such a way that the batsman cannot hit them, and provided he succeeds before he sends up four balls that are not of this nature, he retires the batsman. Should the batsman, however, strike at a ball not coming over the plate and miss it, the pitcher has attained his end just the same. A thorough command of the ball, then, is necessary. When he has got this, he must bear in mind the important fact that the true art of pitching is to deceive the eye of the batsman. That is to say, he must send the ball towards the bat in such a way as to lead the striker to believe that it is coming high when it is really coming low, that it is travelling direct for his chest when it is really going feet away from his body, that it is a fast delivery when in reality it is slow, and so on. Like the bowler in Cricket, if he wants to excel in the game he must use his intellect. Brute strength and fast pitching are all very well in their way, but unless allied to sound judgment, to all intents and purposes they are of very little avail. To keep his judgment, he must keep his temper. He must not, simply because his best deliveries are treated with contempt, lose control of himself. When he loses control of himself, he loses control of the ball; and when that happens, he had better vacate his position, or else he will soon lose his side the match.

The pitcher must, above all things, have a code of signals with his catcher. A movement of the hand, an elevation of the head by the latter, lets the pitcher know that this ball is to be an in-shoot, the other an out-curve. A movement of the head may mean that the pitcher is to throw to second base; a nod may mean that the ball is to be hurled to first base, and so on. They must agree upon their signals, and the services that the catcher will render the pitcher, who cannot watch the field as does the man behind the bat, will be invaluable.

It was doubted for some time in England that the Baseball pitcher could curve or twist a ball in the air. That the average pitcher does so there cannot be a doubt. It seems wonderful that anyone can do so without assistance from the ground, but a lesson or two from a good pitcher will give a likely man the knowledge of how it is done, and then constant, steady practice will do the rest. The beginner must be content with ordinary straight balls at first. The science of pitching will be picked up in time. One thing I would impress upon the pitcher, and it is this, study the batsman. If you find that he is timorous of the deliveries that come near his body, you must attack his weak point. If you discover that he cannot hit a low ball, do not be anxious

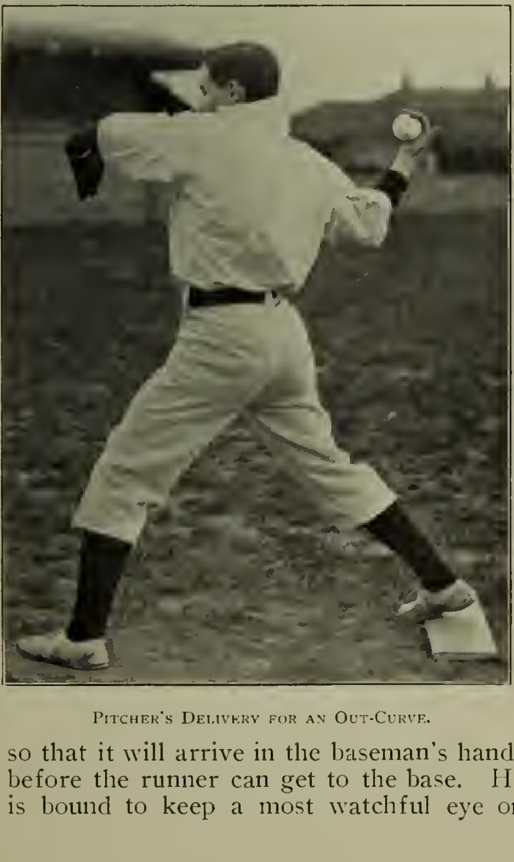


Position for a Drop Curve.

to treat him to high ones. Study the weak points of your adversary. Find where his defence is weakest, and, when you have found the weak spot, turn your attention to scoring off it.

The pitcher, too, must be a man of pluck. In his position the ball will be batted very often to him at lightning speed. He must not be afraid to face it. If he is nervous and timorous he is scarcely likely to pitch with judgment, for he will be so impressed with the idea of avoiding being hit that he will think of little else.

The Catcher.—The catcher's position, to my mind, is the most difficult and most dangerous in the game. When there are not any men on bases the position is an easy one, but when "two strikes" or "three balls" are called, then the troubles commence. He must come right up behind the bat and face the fastest deliveries without flinching. It is a position demanding courage. In addition to courage the catcher must have splendid judgment and a sure eye. His duties are akin to those of the wicket-keeper in Cricket, but considerably more varied. He must be able to hold every third strike missed by a batsman, or, if he drop the ball, he must be alert enough to pick it up in time to hurl it to first base so that it will arrive in the baseman's hands before the runner can get to the base. He is bound to keep a most watchful eye on the base runners so as to cut them off when they endeavour to steal a base. To do this he must be a good fast thrower, and must throw with the greatest judgment, for a ball sent flying wildly over the baseman's head might be the cause of a run or two runs being credited to the opposing side.



Pitcher's Delivery for an Out-Curve.

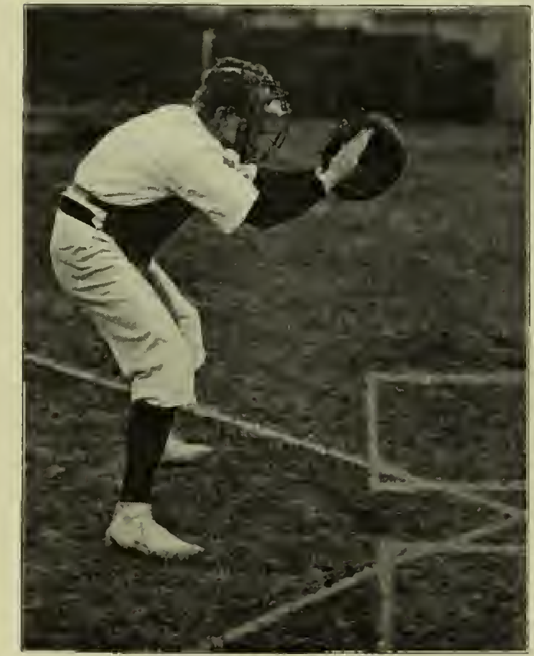
Catcher Throwing to Third Base.

The catcher must have a ready eye for the weak points of a batsman. He is in a better position to detect them than even the pitcher, and when he has discovered them he must bring the code of signals, of which I wrote above, into play to let the pitcher know exactly what kind of a ball to send in.

Some catchers make the mistake of throwing to a base whenever the base-runner makes a feint at stealing a base. Here the catcher's judgment must again be brought into play. He must know by intuition when the base-runner is feigning, or "bluffing" as they say in America, and when he is seriously intending to steal a base. He must, before he throws, first be sure of his baseman; secondly, be sure of his aim; and, thirdly, be sure that he times his throw well.

First Baseman.—The position of first baseman is the one for the tall man, for he has to stop all kind of throws, straight or wild. All basemen should be able to catch well, but the occupant of first base should especially excel in this line. More men are disposed of at first base than at any other position on the field. The ball is returned there from every part of the diamond, as the fielders all endeavour to cut off the base-runner at first base. As a result, balls are hurled in every conceivable way at the poor baseman. They come in every possible direction, and he is expected to stop them all. He is expected to catch the high, the low, the wide, and, if it is absolutely impossible for him to catch them, his fellow players consider that he is bound, at any rate, to stop them. No matter how fast a ball is thrown at him he must get in front of it, for if it passes him there is no telling the harm it may do the side.

Not only must he catch well, but he must be an expert thrower. He must throw straight and with speed. He must, too, have quick judgment to know in an instant when his own base is safe and where the ball is to be sent to do the greatest damage to the opposing side.



Catcher Signalling for a Straight Pitch.

Second Baseman.—The second baseman, being the centre man in the field, is called upon to do his work quickly and reliably. He must be a most active fielder, for being in a direct line with the batsman he receives some of his hottest drives, and must stop them unfailingly. Moreover, he is a target for the catcher, who throws more often to second base to cut off a runner than to any other position in the field. He must be at his base to accept the hottest throws, and prompt to touch at once the base-runner with the ball before that worthy can attain his haven of rest. Catching the ball and stopping it do not cover the duties of second baseman. He must be able to take in the situation at a glance, and be able to throw surely and effectively the very moment the ball is in his hands. A cool head is needed for the position, with judgment and readiness enough to render him equal to any and every emergency.

Short Stop.—Short stop is a very difficult position. As regards fielding, I consider it the most important of any of the positions in the in-field. It is one which calls for a very active player to discharge its duties thoroughly. A very great number of batted balls come to this position, and more often than not they travel at a speed that would disconcert a player who was in any way faint-hearted. He must be a sure fielder and an unerring thrower, for very, very often in the game devolves upon him the duty of securing the treacherous grounder and sending it over to first base in time to cut off the swiftest runner. He is also called upon to back up all the positions of the in-field. He must be behind second baseman when the catcher throws to cut off a runner; the same applies to him with regard to third baseman. He must be on the alert to pick up any ball that glances, when hard hit, off the pitcher's person or clothing. No player consequently is fitted for the position who is not quick and lively in his movements. Great judgment, too, is required in fulfilling the duties of the position. Above all things, he must not be liable to lose his head. He can do more harm by a wild throw to first base than any other fielder, for the simple reason that if he sends the ball out of the reach of first baseman he is sending it right away out of the field of play.

Third Baseman.—The position of third baseman involves duties quite as onerous as those of first and second baseman or short stop. In nearly every respect he resembles them. In catching, throwing, fielding, and in the exercise of good judgment he must excel. He must be more on the alert, if anything, than the other in-fielders, for the catcher and pitcher cannot give him warning of their intention to throw to him to catch a base-runner who has ventured too far from the base. Consequently he must be always on the *qui vive*. His fielding must be particularly good, as on it will frequently depend the increasing of the enemy's score. The third baseman, with short stop and first and second baseman, constitute what is known as the in-field. They must all be in complete accord, and each must know the peculiarities of the others' play. They must work in harmony, and with true dependence on one another. By means of this thorough concord and knowledge of each other's ways many brilliant plays may be brought off. In playing third base the aspirant to Baseball honours must be careful in his throwing. Let him before throwing collect his wits, and when he does throw, let the ball travel low rather than high, for a low ball can be stopped if not caught, whereas a ball overhead is calculated to give the opposing team a base or two. Let the third baseman be energetic and active. Indifferent players seldom trouble themselves to field a ball that does not actually come within their province, but a good player does not wait to consider whether the ball is in his district or not. He goes after it and, if it is fielded by another in-fielder, he has the satisfaction of knowing that he is on the spot to rectify any error his brother player may make.

The Out-fielders.—Left, right, and centre field constitute the out-field, and the occupants of these positions should be equal in their qualifications. Each should be able to throw well. A good long throw is anywhere in the neighbourhood of eighty-five or ninety yards. The out-fielders should not occupy one position all the time. They must use their discretion and judgment. It would be silly to be as far out for the poor hitter as for the heavy slogger. They must study, too, the peculiarities of the batsman. One may have a habit of hitting always in the direction of left field. Another may have a penchant for driving the ball to the other side of the field. A third may have a knack of batting the ball close to the foul lines. A fourth may bat the pitcher's deliveries just over second baseman's head. All these details must be attended to. The out-fielders, too, must be good judges of fly-balls. The ground balls are generally attended to by the in-fielders. In judging fly-balls it is always safer to get well out for a long hit, as it is easier to run in to catch the ball than to run out with it and stand a great chance of missing it. When the out-fielders get a ball, they should not hold it an instant. Throw it at once into the in-field, for a man can never be put out whilst the ball is sojourning in the out-field. Let the novice remember this. No doubt he will feel perplexed at times as to where he should throw. Don't wait. Throw it somewhere into the in-field.

Left Fielder.—The player occupying this position will find that the majority of the out-field hits are made to his part. Consequently be must not be lazy. Because he has not had a ball for some time he must not on that account go to sleep. A very great number of batsmen are dismissed by being caught by the left fielder. He must then be a good catcher, and he should also be a good runner. Speed is a great help in left field, for the simple reason that often he has to travel from right out in the distance, to take a catch batted well over third baseman's head. He must be ready, too, to back up third baseman and short stop, for if the ball passes them, he must be behind them to avert serious consequences. Good judgment is necessary to calculate, immediately the ball leaves the bat, where it is likely to travel, and at what speed it is going. If his judgment tells him that the ball will not reach him on the fly, he must not wait for it to roll to him. He must run to meet it; and this remark applies to the other out-fielders.

SECOND BASE FIELDING.

Centre Fielder.—This player should act in support of the second baseman. If he gives him good backing up there is no saying what an amount of good he can do for his side. He gives the catcher confidence

OUT AT SECOND BASE.

to throw to cut off a runner, since he knows that even if the ball elude second baseman the centre fielder will be behind him to save serious results. If he plays his position well, he deters the base-runner from trying to steal from first to second base. Good eye and quick judgment are as necessary for him as for left fielder, and like all men in responsible positions—and every position in Baseball is responsible—he must reason for himself. In conjunction with second baseman, if he but use his intellect, he can bring off some very tricky plays.

A Left-handed Striker.

Right Fielder.—The hints given to left and centre fielders apply equally to this position. Sure eye and sure hands for catches, an intellect quick to discern the best possible thing to be done in all circumstances, and a wakefulness to his responsibility of securing the balls that manage to get by the first baseman into the outfield are requisite. So I finish with the fielders. Let us now briefly give a little consideration to the batsman.

The Batsman.—To become a good batsman, it is in Baseball as in Cricket. The player must have confidence, nerve, and decision. Of course a good eye is a *sine quâ non.* The batsman, to be a batsman, must keep in constant practice. When at the bat he must study points. He is not the good batsman who, putting every bit of brute strength into his hits, plays purely for applause from the spectators. Such a batsman is no use to his side. Every time he drives the ball away out into the distance he is giving away a chance for his side, for there are fielders waiting to catch the ball as it descends. The batsman who is of use to his side is the one who strives to place the ball. If he sees an opening between first and second base he will endeavour to hit the ball in that direction. Or he will strive to drop one just over second baseman's head. At times he will sacrifice his own chance so that someone else on the side may obtain a run or even advance a base. Batting in Baseball is different from batting in Cricket. To begin with, in England's national game a bat is used; in America's national pastime a club, by no means so broad as the cricket bat, is brought into requisition. In Cricket the ball is bowled and usually touches the ground before reaching the batsman. In Baseball the ball is pitched like a full toss. However, cricketers as a rule will find that they will soon pick up the knack of using the club to advantage.

Immediately the batsman hits a fair ball, he endeavours to get to first base. If he gets there without being caught, or before the ball can be sent to first baseman in time to retire him, he at once begins scheming how he is to reach second base in safety. He may get there on a safe hit made by the succeeding batsman, or he may steal second; that is, that either when the pitcher is off his guard or when he is actually delivering the ball, he makes a dash for second base and arrives there before he can be put out. When he succeeds in making the tour of the bases, the run is scored.

If you consult the diagram you will find I have treated of all the figures except the F. L. (Foul Line) and C. B. (Coacher's Box). I shall now proceed to describe them.

The Foul Line.—Cricketers who have never seen the game played wonder how so few runs are scored when we have but nine fielders. The reason is very simple. The beautiful cuts through the slips and hits to leg are absolutely useless in Baseball. Every ball, to be of any use, must be hit inside the foul line. When it is hit outside the line it counts for nothing, unless one of the opposing team catch it, and then the

Catcher and Striker.

batsman is out, provided the man who catches it is not within ten feet of the home-plate. Should, however, the opposing catcher catch the ball within ten feet of the home-plate a strike is recorded against the batsman.

The Coacher.—In the diagram C. B. means the Coacher's Box. A coacher in Baseball is a member of the side at the bat, and it is his object to assist and direct the base-runner. When the runner has not to be worrying himself as to where the ball has travelled to, he can concentrate all his thoughts on whatever his coach bids him do. The base-runner must put implicit trust in him. He has not to think for himself. He has not to decide when to steal a base, and when to slide. His mentor's word is law. Immediately the coacher says "Go!" the runner must not for the fraction of a second stop to consider. His business is to obey. He will be the more ready to do this if he recollects that it is highly improbable that the coacher, being one of his own side, would counsel any act which would be detrimental to their common interest. Implicit trust must be placed in the coacher.

It must not be imagined, however, that anybody can coach. Such is far from the case. The coacher, like the poet, is born, not made. One might think that the players of most experience would be the best advisers of the base-runner. That is a fallacy. It is the man of quick wit and judgment, the one who evinces a thorough grasp of the points of play, the one who is gifted with the faculty of quick yet sound reasoning that is best adapted for the post. He must, moreover, be gifted with a ready wit, for by a humorous remark or a quaint saying he will often distract the attention of the fielder, and that is precisely what he wants, as he can score off the enemy's unpreparedness.

Trying for Third Base.

Taking a Lead.

In coaching, rude and offensive language must be strictly tabooed, and all remarks must be addressed to the base-runner. While doing this, the coacher is often able, if he have tact, to address other people through the man whom he counsels. A humorous coacher, whilst his humour serves its purpose in increasing the chances of his side, is highly diverting to the spectators, and adds life and zest to the game. Abuse of the privilege would soon render the coacher's office a nuisance, but the proper use of it adds a feature to the game, which is entertaining to all, and of the utmost service to a team.

I must not forget to mention the necessity of the base-runner and coachers thoroughly understanding how to receive a command and how to interpret it. There must be a code of voice inflections on the part of the coacher, letting the runner know when he is to obey and when he is to pay no attention to what is merely "bluff." The coacher may shout "Go!" over and over again, but the runner will pay no attention to the injunction, for he knows it is only used to fool the fielders, since the proper intonation or inflection of the voice was not used. When, however, "Go!" is shouted in the stipulated tone, he must not hesitate the fraction of a second in obeying the word of command.

The Umpire.—As in Cricket, so in Baseball, the position of umpire is most responsible, and at the same time somewhat thankless. The umpire is the man who must be obeyed. His every word is law, and no player may question his decision. True, the captain of a team, and the captain only, may suggest that he has erred in the interpretation of a rule, but he must do so in a thoroughly respectful fashion. The umpire, to fill the position with honour, must be experienced in the rules of the game, quick to read character, that he may know the man who is "bluffing," and the one who appeals for a decision on honest conviction. He must, moreover, be quick in his decisions and prepared to stand by them when once made. The duties of the umpire are very clearly laid down in the rules, and so I shall not enlarge upon them. This I will say—when an umpire is to be chosen, let him be such a one as possesses the confidence of the players, and is possessed of an equable temper and disposition. In fact, the qualifications that go to constitute a good umpire in Cricket or Football are requisite for the one who would excel in the same line in Baseball.

BASEBALL AT THE CHELSEA FOOTBALL GROUND.

Concluding Remarks.—It can scarcely be said that in the present article I have given a thorough exposition of Baseball. This short treatise must serve but as a foundation upon which the reader, by help of the rules, by witnessing Baseball games, and by questioning the players on the points of which he is doubtful, may build the edifice of his own Baseball reputation.

There are many inducements to lead the average Englishman to embrace the American sport. The game is admirably adapted to the requirements of the average professional man or artisan, as it does not call for a great sacrifice of time, inasmuch as the game does not last longer than two hours and a half. But what an amount of exercise is crowded into that short space of time! Every one is busy. Every one is on the move. There is no room for the lazy man. Everybody is given a chance to excel both at the bat and in the field. In Cricket, should you get out first ball, your chance is gone, in all probability, of distinguishing yourself at the bat for that day. It is not so in Baseball. As nine innings are played you have five or six chances more of retrieving your honour. From the sportsman's point of view, Baseball should stand ahead of most manly games. It is open to everybody to learn it and become speedily efficient. Application and diligence are the only requirements. With them the average athlete will, after a game or two, learn every detail; and when he has taken to Baseball I can safely say that he will not be in a hurry to desert it.

R. G. KNOWLES.

GLOSSARY.

Assist.—Any fielder co-operating with another or others in retiring a base-runner is credited with an assist.

Balk.—When a pitcher, with a view to deceiving the batsman, makes a motion as if to pitch the ball to him, and fails to do so, the umpire must declare a balk.

Ball.—A pitched ball, not passing over the home-plate at an altitude not higher than the batsman's shoulder nor lower than his knee, must be declared a ball, provided the batsman does not strike at it.

Base Hit.—Any ball so hit that, provided an error has not been made, it cannot be fielded in time to prevent the batsman from reaching his base.

Base on Balls.—Is a base accorded the batsman when the pitcher has delivered four balls.

Batsman's Box.—The space on either side of the home-plate in which the batsman must stand.

Battery.—The pitcher and catcher.

Block Ball.—A ball in play touched by a spectator or by one of the batting side when not actively engaged in the game.

Bunt Hit.—A ball deliberately batted so slowly to the in-field that it cannot be fielded in time to put out the base-runner.

Coacher's Box.—The space in foul territory near first and third base devoted to the coacher.

Dead Ball.—A ball delivered by the pitcher which, when it has not been struck at, touches any part of the batsman's person or clothing, or any part of the umpire's person or clothing, while on foul ground, without first passing the catcher.

Diamond.—The ground is so called on account of its shape.

Double Play.—A play in which the ball is handled quickly enough to retire two men.

Earned Run.—When the round of the bases is made without the help of a fielder's error, before the side can be retired, the run is "earned."

Fair Ball.—A ball passing over the home-plate not higher than the batsman's shoulder, nor lower than his knee.

Fair Hit.—A ball batted within the foul lines and remaining in that territory till it has passed first and third bases, or a ball batted outside the foul lines which rolls inside before passing first or third base.

Fly Ball.—A ball batted into the air.

Forced Out.—When a base-runner is compelled to make room for his successor and is touched by the ball held by a fielder or cannot reach the next base as soon as the fielder holding the ball.

Foul Ball.—A ball batted into foul ground, except in the case of a foul tip.

Foul Lines.—The lines running from the home-plate through first and third bases to the extremity of the field.

Foul Strike.—A ball batted by the batsman out of position or a ball bunted which rolls into foul ground.

Foul Tip.—A foul hit not rising above the batsman's head and caught by the catcher within 10 ft. of the plate.

Home Run.—A complete circuit of the bases made on a hit without the help of a fielder's error.

In-field.—First, second, and third basemen and short stop.

Out-field.—Right, centre, and left fielders.

Passed Ball.—A pitched ball which passes the catcher and allows the base-runner to advance a base.

Plate.—The home base.

Pitcher's Box.—The plate on which the pitcher must have one foot when delivering a ball to the batsman.

Sacrifice Hit.—When the batsman purposely hits a ball in such a way that he is put out, with the view of advancing a base-runner.

Shut Out.—An innings in which a side does not score a run.

Slide.—When the base-runner, to avoid being put out, slides feet or head first to a base.

Stolen Base.—A base obtained by a runner without help from a hit by a batsman.

Strike.—When the batsman tries and fails to hit a ball delivered by a pitcher or does not strike at a fair ball.

Strike Out.—A batsman strikes out when three strikes have been called upon him.

Triple Play.—A play in which the ball is handled quickly enough to retire three men.

Wild Pitch.—A ball pitched out of the reach of the catcher, which allows a base-runner to advance a base or bases.

Wild Throw.—A ball thrown out of reach of the fielder to whom it was directed.

SIMPLIFIED RULES.

1. Each side consists of nine players.

2. An innings is complete when three men on the batting side are out. Three men being out constitutes an innings.

3. A game consists of nine innings played by each side.

4. The players go to the bat in regular order: the first man on the list of his side being the first man to bat in the first innings. Afterwards the first batsman in an innings is the one next on the list to the third batsman out in the previous innings. But, if a base-runner is the third man retired, and this occurs while a man is at bat, such batsman shall bat first in the succeeding innings.

5. The batsman must not step out of his position, known as the batsman's box, and must strike at every ball delivered by the pitcher that crosses the plate between the knee and the shoulder.

6. If the batsman fails to strike at a good ball so delivered, the umpire must call "One strike."

7. If the batsman strikes at any ball, whether it be a good or bad one, and fails to hit it, the umpire must call "One strike."

8. When the umpire has called "Three strikes," the batsman is out, providing the ball constituting the third strike be caught by the catcher before it touches the ground. If the catcher fails to hold the ball the batsman has an opportunity of reaching first base, but the catcher may recover the ball and intercept the base-runner by throwing it to first base. If the ball reaches the base before the runner, he is out.

9. If the pitcher delivers a ball which does not pass across the plate between the batsman's knee and shoulder, the umpire must call "One ball."

10. If the umpire calls four balls, the batsman is entitled to his first base.

11. If the batsman hits the ball so that it falls outside the foul lines, it is a foul hit, and does not count, provided that if a fielder catches it before it touches the ground, the batsman is out.

12. If the batsman hits the ball so that it falls inside the foul lines, it is a fair hit. Any ball hit to ground inside the foul lines is a fair hit, unless it should roll outside the foul lines before reaching first or third base, as the case may be. Any ball hit to ground outside the foul lines which rolls inside the foul lines before reaching first or third base, as the case may be, is a fair hit.

13. The batsman becomes a base-runner immediately he has made a fair hit; immediately after four balls have been called by the umpire; immediately after three strikes have been called by the umpire, provided that the catcher has not held the ball at third strike, as provided in Rule 8; if any part of his person be hit by a

ball delivered by the pitcher, unless the hit be upon the forearm; and immediately after the pitcher has illegally delivered a ball.

The batsman is out:—

14. If he fails to take his position at the bat in his order of batting.

15. If he fails to take such position within one minute after the umpire has called for the batsman.

16. If he makes a foul strike. To make a foul strike is to hit the ball when not standing in the batsman's box, as provided in Rule 5.

17. If he attempts to hinder the catcher from fielding or throwing the ball.

18. If, while the first base be occupied by a base-runner, three strikes be called on him by the umpire, except when two men are already out.

19. If, while attempting a third strike, the ball touches any part of his person.

20. If, after two strikes have been called, the batsman obviously attempts to make a foul strike.

21. If the ball struck by him, whether in a fair or foul hit, be caught before touching the ground.

22. If the catcher catches the ball at third strike before it touches the ground.

23. If, after he has made a fair hit, or after the third strike (provided in the latter case that the catcher has not caught the ball before it touches the ground) he is touched by the ball in the hands of a fielder before he has reached the first base.

24. If, after he has made a fair hit, or after the third strike, as mentioned in the preceding rule, the ball is securely held by a fielder who is touching the first base with any part of his person.

25. If, in running the last half of the distance from home-plate to first base, he runs outside the three-foot line, unless to avoid a fielder attempting to field the ball.

The batsman is entitled, without being put out, to a base:—

26. When the umpire has called four balls.

27. If the umpire has awarded a base to a succeeding batsman, and the base-runner is thereby forced to vacate the base held by him.

28. If the umpire calls a balk.

29. If the ball, delivered by the pitcher, passes the catcher and touches the umpire or any fence or building within 90 ft. of the home-plate.

30. If, upon a fair hit, the ball strikes the person of the umpire standing upon fair ground.

31. If the fielder stops or catches a batted ball with his hat or any part of his dress.

The base-runner must return to his base, and is entitled to do so without being put out:—

32. If the umpire declares a foul hit.

33. If the umpire declares a foul strike.

34. If the umpire declares a dead ball.

The base-runner is out:—

35. If, in running from first to second base, from second to third base, or from third base to home-plate, he runs more than 3 ft. from a direct line between such bases, to avoid being touched by the ball in the hands of a fielder.

36. If he in any way obstructs a fielder attempting to field the ball, or intentionally interferes with a thrown ball.

37. If, while the ball is in play, he is touched with the ball in the hands of a fielder, unless some part of his person is touching a base he is entitled to occupy. The ball must be held by the fielder while touching him. In running to first base, he may overrun the base, and will be allowed to return to it without being put out for being off his base. Provided he must return at once and touch the base, and afterwards he may be put out as at any other base. And if, after overrunning first base, he should attempt to run to second base or should turn to the left as though about to do so, he may be put out. To return to and retouch an overrun base, the runner must turn to the right.

38. If he should start to run on a fly ball and he is touched with the ball after it is caught before he has returned to his base. The base-runner must not run on a fly ball until it has been momentarily held by a fielder. A fly ball is a ball caught either in fair or foul territory before it touches the ground.

39. If he is put out when forced to vacate his base under the following circumstances: when the batsman becomes a base-runner, the players occupying the bases in advance of him must vacate those bases in favour of the batsman or succeeeding base-runner, and cannot return to such bases unless the batsman is put out at first base. Then they have the privilege of returning to their bases.

40. If he is hit by a batted ball before it touches a fielder.

41. If, when running bases or returning to a base, he fails to touch each intervening base.

42. If, when the umpire calls "play" after any suspension of a game, he fails to return to and retouch the base he occupied when "time" was called.

43. A run is scored by a base-runner running one hundred and twenty yards and touching first base, second base, third base, and home-plate in succession.

Bibliography.—*The Art of Pitching and Fielding*; *The Art of Batting and Base Running*, H. Chadwick (N.Y.), 1886; *Baseball Guide, Spalding's Official*, 241 Broadway, N.Y., 1886; *Baseball*, J. M. Ward, Philadelphia, 1888; *Baseball*, R. G. Knowles and R. Morton (Routledge), 1896; *The Book of School and College Sports*, R. H. Barbour (Appleton, N.Y.), 1904.

BASS, BLACK.—There are two species of Black Bass, the small-mouthed Bass (*Micropterus dolomieu*, Lacépède) and the large-mouthed Bass (*Micropterus salmoides*, Lacépède). The methods of angling for them are the same. Their appearance and habits are similar, though the small-mouthed Bass prefers swift and rocky streams, while the large-mouth is more at home in lacustrine waters and sluggish streams. When inhabiting the same waters their game qualities are equal, though the small-mouth in swift streams is more active than the large-mouth in still waters.

In England.—Several years ago, the small-mouthed Bass was placed in several small lakes in England, but the experiment was a failure, as it is not suited to such waters. Had the large-mouthed been substituted, the broads and lakes of England might now be teeming with one of the gamest fish.

There exists an unwarranted prejudice against the Black Bass among British anglers which originated (as my friend Mr. R. B. Marston informed me) through the over-zealous assertions of the late George Sheppard Page and Professor G. Brown

Goode at a meeting of British anglers during the Fisheries Exhibition in 1883. In their efforts to convince their auditors of the grand game qualities of the Black Bass, they unwittingly conveyed the impression that it was a very predatory and voracious fish, as bad as the Pike, if not worse. This idea, of course, is entirely erroneous. The Black Bass is not at all a piscivorous fish in the true meaning of the term. The character of a fish's teeth indicates its food. The Pike, having sharp, conical teeth, is pre-eminently piscivorous, as such teeth imply. So, in a measure, is the Brown Trout, which has sharp, conical teeth, though not so numerous or strong as those of the Pike.

Food.—On the other hand, the Black Bass has villiform or brush-like teeth, much like the surface of a tooth-brush, which are incapable of wounding or cutting: such teeth indicate a diet of crustaceans and insects. As a matter of fact, seventy-five per cent. of the natural food of the Black Bass consists of crayfish, but like all carnivorous fishes, the Bass occasionally swallows small fish, frogs, &c., especially if they are found in a disabled condition; and this explains why a minnow proves a good bait, and is eagerly taken by a Black Bass when he may ignore a school of lively minnows swimming near him. Those of the school are hard to catch, while the one on the hook is easily captured.

There are countless small lakes in America where the Black Bass, Trout, and many other species of fishes have co-existed from time immemorial, showing conclusively that the Black Bass is not the enemy of other fishes, and does not militate against their increase in the same waters, even when these waters are of an isolated character. On the contrary, the Black Bass, under such circumstances, does not multiply so rapidly as the other species, notwithstanding that it guards its eggs and young. The unfortunate introduction of the German Carp into American waters has been very disastrous to the Black Bass, owing to the spawn-eating proclivities of the intruder. It astonishes the American angler to learn that the English are so prejudiced against the Black Bass, although tolerating such a marauding fish as the Pike, to say nothing of spawn-eaters like the Carp, Tench, Dace, Perch, &c.

Game Qualities.—The Black Bass is a percoid fish and much higher in the scheme of evolution than the Salmon or Trout, and in game qualities is their peer—"Inch for inch, and pound for pound, he is the gamest fish that swims." "He has the arrowy rush and vigour of the Trout, the untiring strength and bold leap of the Salmon, while he has a system of fighting tactics peculiarly his own." These words seem to me, after twenty-five years' experience, as true as ever.

BLACK BASS.

Distribution.—The Black Bass is capable of a much wider geographical distribution than most other game fish. In America, its range extends through twenty-five degrees of latitude and thirty degrees of longitude, which shows that it can withstand very great variations of temperature and vicissitudes of aquatic life.

In Germany its introduction has been very successful, especially that of the large-mouthed Bass. It has also been transplanted to France, the Netherlands, and other countries.

Fly-Fishing.—The methods of angling for Black Bass are fly-fishing, minnow-casting, still-fishing, and trolling. Fly-fishing, of course, comes first in importance. The Black Bass rises to the artificial fly as eagerly as the Salmon or Trout, and perhaps under more varying conditions. While it has the boldness of either, it is more wary and intelligent, and must be fished for with corresponding caution, for inasmuch as it is only in comparatively shallow water that any fish rises to the fly, it follows that all due caution must be exercised to keep out of its sight.

If fishing from a boat, the angler should keep in deep water and cast toward the shallows or shore. If fishing from the bank, he should stand well back from the shore and make long casts, or be screened from observation by trees, bushes, &c. If wading, which is the preferable plan, he may fish either up or down stream, but fishing down stream is preferred in America, particularly in swift streams, as the line is thereby always straight and taut, and a more natural appearance is given to the fly.

The best time for fly-fishing for Black Bass is late in the afternoon, toward sunset, and during twilight. The early morning hours are also favourable; but, except on very dark, cloudy days, the angler will catch nothing for his pains during the hours of mid-day. The reason for this is that all fishes feed mostly at night, and in shallow water; consequently, they are found in such situations at the times mentioned, approaching or departing from their feeding grounds.

The method of casting is about the same in vogue for wet-fly fishing for Trout. One or two flies may be used in the cast. The dropper, or hand-fly, should be three or four feet above the stretcher, or tail-fly. The leader, or casting line, should be from six to nine feet of good, round, single gut. Almost any good "general" Trout fly of large size, tied on hooks No. 4 to 7, will answer for Black Bass. The Coachman, Red Ibis, Professor, Grizzly King, Alexandra, Montreal, &c., and small Silver Doctor are all good flies, as also the various hackles (Palmers), if made large and bushy. Among the best flies used in America are the Polka, Henshall, and Oriole.

Moderately long casts, about fifty feet, should be employed for Black Bass fishing, though if there should be a brisk breeze with ruffled water, somewhat shorter casts will answer. The line should be always straight and taut. After the cast is made the flies should be gently roved or drawn from side to side with jerky or tremulous motions, to simulate the movements of a natural fly. They should be permitted to sink frequently for several inches, or a foot, in likely-looking places, especially in lake or pond fishing.

The angler should strike upon sight or touch; that is, he should instantly strike upon feeling the slightest touch of the fish, or upon seeing its swirl. Striking is merely a turn of the wrist with a taut line, which is sufficient to set the hook. After the fish is hooked, he should be kept on a bent rod and taut line, never under any circumstances having slack line. When the Bass leaps from the water, which he may do half a dozen times before he is in the landing-net, the straightening of the bent rod is sufficient to keep the line taut while he is in the air, but he should be followed into the water by slightly lowering the tip, if necessary, to prevent the hook from tearing out with the weight, and the instant he reaches the water he should again feel the spring of the rod. He should be reeled into close quarters as soon as possible, and kept near the surface of the water. The spring of the rod will eventually cause him to turn on his side, when he should be taken into the landing-net.

The most suitable rod is ten feet three inches long, and weighs not more than eight ounces. Any good Trout fly-rod of about this description will answer. The line and click-reel ordinarily used for Trout fishing do very well for Black Bass fishing.

Minnow-Fishing.—Casting the minnow for Black Bass is a very artistic mode of fishing. It requires special tools and tackle. In America the short, single-handed rod known as the "Henshall" rod is universally employed. It is eight feet three inches long, and weighs eight ounces for an ash and lancewood, or green-heart rod, or seven and a half ounces for a split bamboo. It is somewhat stiffer than a Trout fly-rod, but pliable enough for all the emergencies of playing a fish. A first-class multiplying reel is a *sine quâ non*, as the bait is cast from the reel. A braided line of undressed silk of the smallest calibre should be used. Twisted lines kink too much for casting. A leader, or casting-line of gut, is not required, the swelled hook being attached directly to the reel-line by a small brass swivel. A sinker of the smallest size may also be affixed, if necessary.

The minnow, from two to four inches in length, is hooked through the lips, and reeled up to within a foot or two of the tip of the rod, when it is cast to the left or right for a distance of from seventy-five to one hundred and fifty feet, which is easily done with the tackle mentioned, and a little practice. The cast is not made over-hand or over-head as in fly-fishing, but underhanded—that is, from below upward—the tip of the rod being a foot or two from the ground or water at the beginning of the cast. The running of the reel must be controlled by the thumb, which should maintain a gentle, but uniform, pressure upon the spool to prevent over-running or backlashing, and when the bait reaches the desired spot the thumb stops the reel by a stronger pressure. The bait is allowed to swim about, if lively, and the line slowly reeled in, giving a natural, swimming motion to the minnow; a new cast is then made in another direction. The playing and landing of the Bass is the same as in fly-fishing.

Still-Fishing.—Still-fishing is about the same as Perch fishing in England, and the best Perch tools and tackle may be employed, when of sufficient strength. A float may be used, though it is generally dispensed with in America, except where the bottom is grassy or mossy. Usually still fishing is practised from an anchored boat. Any time of day will answer for still-fishing or minnow-casting, though the Bass will be found in deeper water during the middle of the day.

Trolling.—Trolling is practised with a stiffer rod than that for minnow-casting or still-fishing, and a somewhat larger line—one of flax will answer—of about the size used for large Perch. The bait may be a large minnow, hooked through the lips, or a trolling spoon or spinner of small size. One hook is all-sufficient. A minnow, hooked through the lips with a single hook, presents a more natural appearance and is far more effective than the most approved spinning-tackle, with its forbidding array of flying hooks. Trolling is practised from a boat, which is propelled over the feeding-grounds at a speed varying according to local conditions. From fifty to one hundred and fifty feet of line are let out from the reel. The Bass hooks itself when it strikes.

JAMES A. HENSHALL.

MEASUREMENTS, &c.—Length of head 3¾ to 4, of caudal fin 5¾, height of body 4¼ to $4^{2}/_{3}$ in the total length. *Eye*—diameter 4½ to 5 (or even proportionately larger in very small examples) in the length of the head, 1¼ to 1½ diameters from the end of the snout, and 1¼ apart. Posterior edge of the preopercle strongly serrated, the largest tooth being at its rounded angle, and three more forwardly directed along its lower limb. Two opercular spines, the rest of the bones of the head unarmed. Jaws of about the same length anteriorly; the maxilla reaches to beneath the first, third, or middle of the orbit. Nostrils patent. *Teeth*—villiform in the jaws, the outer row in the upper somewhat larger than the rest: in an almost crescentic spot on the vomer, in a band on the palatines, and also at the base of the tongue. *Fins*—occasionally the first spine in the anterior dorsal fin is absent, the first two are short, the third two-thirds the length of the fourth, which is equal to the two succeeding, which are the highest, and slightly exceed the length of the rays of the second dorsal. Third anal spine slightly longer than the second. Caudal forked. *Scales*—ctenoid. *Lateral-line*—nearly straight, passing from the upper edge of the opercle to the centre of the base of the caudal fin. *Intestines*—five short cœcal appendages. *Colours*—gray on the back, becoming silvery on the sides and beneath. A dark spot at the upper half or two-thirds of the opercle, darkest posteriorly. Dorsal, anal, and caudal fins stained with gray externally; pectorals and ventrals yellowish-white. The young have usually some fine dark spots scattered over the body.

SEA BASS.

Day, *Fishes of Great Britain and Ireland*, vol. i., p. 9.

BASS, SEA (*Labrax lupus*) [*See* SEA-FISHING].

BEAR-SHOOTING.—

AMERICA, NORTH.—Bears are the most widely distributed of all North American big game, and may be encountered at any moment almost anywhere in the Rockies.

There are three species of Bear in North America, the Grizzly (*Ursus horribilis*), to which the following notes chiefly apply, the Black Bear (*U. americanus*), a much smaller and less formidable beast, and the Polar (*U. maritimus*) [*See* BEAR, POLAR]. The so-called Brown Bear of North America is a variety only, though many sportsmen insist on regarding it as a distinct species.

Grizzly Bears are not nowadays to be found east of the Rockies, and even in that range there is sometimes considerable difficulty in procuring a trophy. They constantly change their quarters according to where the best food supply is to be found. In the early spring, when the skunk cabbage shoots forth its handsome yellow flower, bears are high up the mountain sides digging at the roots. Later on, when putrid salmon strew the river banks, they will be found revelling in a nauseous meal. Where salmon do not exist, they will pick up a living on beetles and other insects until the berries ripen in the fall, when they claw down the luscious fruit and lay on their supply of fat preparatory to hibernating.

Baiting.—Of the various modes of hunting bears, by far the most successful and pleasant is baiting for them. This can, however, only be accomplished in a country plentiful in deer; which should be killed and left in suitable places, care being taken to select spots which the sportsman can easily approach unperceived, for though bears make little use of their eyes, they are keen-scented, quick of hearing, and surprisingly active. The bait must be inspected within two or three days, and should it be found partially eaten or buried, the hunter should lie in wait at dawn or nightfall for the bear, taking care to approach up-wind and noiselessly. In places where bears have been much hunted, they become nocturnal in their habits, but otherwise they frequently wander abroad during the daytime.

[*Photo. by H. J. Shepstone.*

Grizzly Bears in Yellowstone Park.

A wounded or seemingly dead bear should be approached with caution; for even when shot through the heart, it can still prove dangerous at close quarters. Through the neck, if it be sufficiently exposed, is the best shot; otherwise spine, shoulder, or head is good enough. If, as sometimes happens, the hunter comes upon a grizzly with cubs, let him pay due attention to the old bear before meddling with the cubs.

Hunting with Dogs.—Another mode of hunting bears is with well-trained dogs, which quickly "tree" the black bear, while a grizzly, being unable to climb, will be held at bay until the sportsman comes up.

From Canoes.—On certain rivers whose banks are composed of mud flats, or fringed with berry-bearing bushes, bears are hunted from canoes which are paddled noiselessly in and out of every irregularity of the bank, until either a bear is seen grubbing in the mud or eating dead salmon, or can be heard dragging down berries. If a clear view of him cannot be obtained, there is nothing for it but to wait patiently until he appears, for the underwood in districts usually haunted by bears is so dense that to approach unheard would be impossible.

Choice of Ground, &c.—The best furred bears come from the north coast of British Columbia and up the Skeena river, where they are mostly killed in May just after leaving the *cache*, when the fur is at its prime. They are in the finest condition from September to May, according to climate; after the end of May the wool falls out, the long hairs slip, and the pelt becomes valueless until the end of September.

The mode of hunting is most arduous and uncomfortable. While the snow is still deep in the timber, but rapidly melting on the mountain side, a likely valley must be sought, the sides of which rise almost perpendicular in this country. Here, on swampy ground surrounded by patches of snow, the tent must be pitched and no fire lighted. Morning and evening the hunter scans the steep rocky sides of the valley or cañon until high up he spies a bear. Carefully locating it, he starts on a perilous climb of an hour's duration, and is usually unable to see the bear at the end of it. Sometimes from a spot below he may see as many as seven bears, but on getting close to them, all are hidden by great boulders of rock. If the sun shines, it becomes too dangerous for climbing; warning avalanches come crashing down, and if one does not fall on a man, his weight is sufficient to start another. This class of hunting is suitable only for Indians.

Bears' *caches*, as they call the holes wherein they spend the winter in a more or less torpid condition from about December to April or May, are often discovered during the summer, and if the exact spot can be found when deeply covered with snow it is almost certain to contain a bear; here, too, the she-bear gives birth to her young.

The largest bear in the world, excepting the Polar Bear, inhabits Alaska, and does not appear to have received due attention from any naturalist. It differs somewhat from the grizzly in uniformity of colour and in the shape of its claws, and is said to be plentiful in the dense country around Mount Elias.

A ·500 Express is, taken all round, the finest weapon for the work. No one who can handle a rifle should require to give his bear more than one bullet. The grizzly being an animal of uncertain temper, it is well to reserve the second barrel, in case of accidents. J. TURNER TURNER.

SHOOTING A GRIZZLY IN THE ROCKY MOUNTAINS.

INDIA.—The **Sloth Bear** (*Melursus labiatus*) is the only species found throughout India to the south of the Himalayas.

Habits.—It is common in the hill ranges and jungles, more especially where the ground is rocky. Its habits are nocturnal; during the day it lies up in thick jungle or in caves and recesses among the rocks. It may occasionally be met with by sportsmen out stalking early in the morning or late in the afternoon; but as a rule, except when driven out in the course of a beat, it will not be observed during the day. Its food consists of the jungle fruits, ants, beetles, and other insects, and it is also fond of honey, and climbs the forest trees to procure the honeycombs which hang from the boughs. Instances have been known of its eating flesh, but they are rare. Like all wild animals it avoids man, but may attack when suddenly come upon; and many natives are mauled by bears that they have disturbed. In a beat, bears coming out of holes in the rocks at the last moment, when the beat is close to them, often charge the beaters. On the whole, however, this bear is by no means a dangerous animal before it has been fired at and wounded, but when wounded and followed up, it will often charge. The writer discredits the popular idea that the bear rises on its hind-legs and hugs its adversary. He has never seen a charging bear rise on its hind legs. Bears can stand erect, and do so to look about them in long grass or jungle that they cannot see over on all-fours. The soles of their feet leave a print not unlike that of a child's foot. Their cylindrical bones resemble the same bones in a human skeleton more closely than those of most other animals; and this formation enables them to assume the erect position. Their claws are long, and with them they dig up the ground for roots, ants, and termites, and turn over stones to get the beetles and insects that lodge there. The female has generally two cubs, sometimes three, which remain with her till nearly full-grown. When young, she carries them on her back. In a beat, a she-bear will often be seen galloping along with her cubs hanging on to her. The cub clings to the long hair on her shoulders with his fore-legs, the hind-legs hanging down her side well clear of the ground. The "Indian Black Bear," as it is also called, has long and shaggy hair, especially on the top of the shoulders; and on the breast is a large yellowish crescent-shaped mark. The muzzle is of a dirty white. As the hair is very coarse, an Indian bear's skin is not of much value as a trophy.

Methods of Hunting.—Bears in India are not usually made a special object of sport. They are generally shot when men are out tiger-shooting—on days when no tigers are abroad. A chance beat on suitable ground often produces a bear or two. Bears are turned out in the course of a beat for tiger, but on such occasions they are not fired at. They are driven in the same way as all large game has to be driven in India. A crowd of beaters are collected from the nearest villages, a few of whom have tom-toms and other native instruments, useful not only in waking up the animals and keeping them moving, but also in keeping the beaters in line. A large number of stops have to be placed in trees on either side of the intended drive to prevent the animal breaking out at the side. The sportsman is placed in a tree or on a rock in front, and if the drive has been properly planned and carried out (the chief, if not the only, secret of success in this kind of shooting), the animal passes within a few yards, and, whether walking or galloping, affords a very easy shot.

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AMERICAN BLACK BEAR.

Another way of shooting bears is to visit before daylight the rocks, in which they are known to lie up, and to intercept them as they return from their nocturnal rambles. They are also shot by sportsmen when stalking bison or deer. The sportsman, walking through the jungle, sees them by chance and stalks them; but it is no good going out with the special object of stalking bears, as they are not numerous enough to make it worth while, so far, at least, as the Indian Black Bear is concerned, though it is different with the Himalayan Black Bear and the Brown Bear.

Weapon, &c.—Every sportsman has his own fancy as to the best rifle for the work. The writer prefers a good double-barrelled ·500 Express to any other rifle for all kinds of soft-skinned big game. It is comparatively light, can be quickly manipulated for a running or snap shot, and better shooting, especially with running shots, is made with it than with a heavy rifle. The shot, if at all properly placed, will certainly kill the animal in a few seconds. The only objection to it is that, in the case of a charge, an Express bullet does not give the knock-down blow of a heavier solid bullet, and is therefore less likely to stop the charging animal. On the other hand, the proportion of charges to animals fired at is extremely small, and the weapon that will bring most game down is the preferable one. At any rate, a ·500 Express is quite big enough for a bear. In firing at a bear it is necessary to remember that the animal is not so large as it looks, and that a good deal of the apparent size is due to its long hair. All shots should be aimed so as to enter the cavity of the chest. Behind the shoulder, through the point of the shoulder, and in the centre of the yellowish mark on the chest, according to the position of the animal, are the usual shots. Through the back of the skull or neck is also fatal, but the body shot is recommended, the mark being greater.

J. D. INVERARITY.

[The other Indian Bears are the Black (*U. torquatus*) and the Snow, or Isabelline (*U. isabellinus*), both of the Himalayas. The former is chiefly to be found in the forests at the base of the range, where it lives on fruits, acorns, the crops of the villagers, and occasional carrion. It feeds at night and is usually shot as it comes to or leaves its feeding-ground.

The Isabelline Bear, on the other hand, is chiefly encountered along the snow-line. Like the foregoing species, it hibernates; and its food also differs little, except in a preference for roots.]

POLAR (*Ursus maritimus*).

Habitat.—The Polar Bear ranges over the whole of the discovered tracts of the North Polar regions, but to a greater extent in the southern part of the Arctic zone than further North. In the expedition of Sir George Nares in 1875-6, no bears were seen north of lat. 79°, although travelling parties reached the latitude of 83° 20′. Previous to this, however, bears had been seen, and killed, though not in great quantities, by the United States exploring expedition under Captain Hall as far north as 81° in the locality visited by Nares. They are found in great numbers in Franz Josef land, in Novaya-Zemlya, in Spitzbergen, along the east coast of Greenland, in Davis Straits and Baffin's Bay, and in the numerous channels and inlets leading thence, and they are encountered as far south as Hudson's Strait and Bay, and along the Coast of Labrador. They might, with a fair show of reason, be regarded as aquatic rather than terrestrial animals; for not only have they been found on icefloes and icebergs hundreds of miles from any land, but I have come across them swimming unconcernedly in the water with no ice in sight and more than eighty miles from land!

Colour, Size, Habits, &c.—Their colour is sometimes of a very pure white, the tip of the fur in places being tinged slightly with a yellowish hue. Their feet are large, flat, and muscular, being armed with formidable claws, and they have very strong and powerful teeth. They do not hug, as is alleged of their congeners the brown bears, but bite and use their claws freely. It is averred that they never eat their victims until life is extinct, but will play with them as a cat with a mouse.

The Polar bear attains a great size. I have myself killed them over 10½ feet in length, and weighing something like half a ton, and they have been known to exceed even 13 feet in length; but this is, I believe, quite an abnormal size, the average being about 7 or 8 feet from the tip of the nose to the end of the tail. They possess enormous strength. On one occasion we disturbed a bear in the enjoyment of his feast on the ice, which proved to be the entire body of a white whale, fifteen feet in length and weighing about 3 or 4 tons. This whale was presumably found by the bear floating dead in the water, and must have been dragged by the bear on to the ice where we found it. It is difficult to conceive how this could have been accomplished, for it would have taken at least half-a-dozen strong men with ropes and other appliances to have hauled it up on to the icefloe.

The flesh of the bear is eatable when nothing better can be obtained, but it is coarse and rank and terribly tough; the liver, however, is to be avoided as an article of human food, for it has the reputation of producing severe bowel complaints.

Their rate of progression over soft snow is wonderful, and when once alarmed, unless stopped by a bullet, they speedily place a safe distance between themselves and their pursuers. Their powers of locomotion in the water are also marvellous, and it is by no means an uncommon incident to see them plunge after a seal, and pursue it in its own element, but whether with a successful result I have never yet been able satisfactorily to determine. They will watch a seal for hours together on an icefloe, and if unable to approach it without being observed, have been known to slip quietly into the water, and swim towards it *under the ice*, and then emerge suddenly alongside of their prey, so that if it takes to the water it falls into the clutches of the bear, and if it remains on the ice it soon falls a victim to its powerful adversary.

[*Photo. by W. S. Berridge, F.Z.S.*

SLOTH BEAR.

[*Photo. by W. P. Dando, F.Z.S.*

ISABELLINE BEAR.

Unless rendered fierce by pain or hunger, they will very rarely attack man. On one occasion only can I call to mind their assuming the offensive, not being themselves attacked or wounded. In that instance, it was a female accompanied by her cub. We first sighted them on a piece of ice, and immediately pulled lustily towards them in our boat. Without, however, waiting for us to come to close quarters the bear, followed by her little one, plunged into the water, swam vigorously towards us, and would certainly have succeeded in getting into the boat had not a bullet from my rifle terminated her existence. The cub was captured alive and took aboard the ship. It was a most ferocious little beast, and was just as wild and untamable after it had been on board three months, as on the day of its capture. It sounds somewhat unnatural, but the only food it had for the first few days after it came on board was the flesh of its own mother, which it devoured greedily and with apparent enjoyment.

On another occasion we had observed a bear reposing apparently asleep on the ice. I proceeded to stalk it, but the noise made by my breaking through a piece of rotten ice disturbed the animal in his slumbers and caused him to get up. Thinking he was contemplating a retreat, I took a hasty and long shot, which wounded him badly and caused him to slink away behind some hummocks. Running up somewhat imprudently in my haste to secure his skin, I suddenly came across the beast, which at once rushed at me open-mouthed, when, fortunately for myself, I succeeded at about five yards in planting a bullet in his head, which effectually put a stop to any further developments.

These are the only instances that have come under my personal observation, in which the Polar bear has assumed a disposition to act on the offensive. On all other occasions they have been exceedingly timorous when scenting danger.

The majority of bears that are killed by the vessels engaged in sealing or whaling die in the water, for on the approach of a boat, unless they happen to be on an extensive field of ice, they invariably endeavour to effect their escape by swimming. As a boat can be propelled at double the speed at which a bear can swim, the poor beast is very soon overhauled, when a bullet through its brain kills it.

This, however, is the poorest of sport; in fact, it is no sport at all, for the element of danger, which makes the pursuit of savage animals so attractive, is altogether wanting. Pursuing a bear on a large icefloe, or pack, is, however, altogether different. Prudence has then to be exercised in approaching the quarry; care has to be taken to avoid stepping on treacherous pieces of young ice; and when after, perchance, much trouble and exertion, the hunter succeeds in approaching within the desired range, more skill, care and dexterity are required in handling the rifle in order to ensure killing, than would be the case if the beast were swimming in the water, where it would be comparatively harmless.

Vulnerable spot.—My experience has taught me that the most vulnerable part of a Polar bear is the forehead. I have known several instances of bears being hit in other parts of the body, and they have either succeeded in making good their escape, or required another bullet to finish them. The head is, of course, a small mark, but a shot in it is instantaneously effective.

Weapon.—I have always used a small Martini-Henry rifle with a ·45 solid bullet; but I am inclined to think that a good magazine rifle carrying a ·4 expanding bullet would be the best and safest for Polar bear shooting.

Range.—Unless a bear is actually making off at speed over the ice, I should deprecate firing at a greater distance than 15 or 20 yards; the nearer you are to the animal, the greater the chance of hitting it in a vital spot. They are wonderfully tenacious of life, and unless hit in the head will scamper away over the ice and through soft snow with perhaps two or three bullets in them, leaving behind a bright crimson trail on the otherwise spotless snow with which the ice is covered.

To sum up, the Polar bear is by no means a formidable beast to contend with, if the hunter is armed with a good magazine rifle, is a fairly reliable shot, and is prepared to undertake a trip to the "regions of thick-ribbed ice" in quest of his prey.

A. H. MARKHAM.

RUSSIA (Bear = *Russ. Mědvўed*).—Though the number of bears (*Ursus arctos*) killed within reasonable distance of St. Petersburg has of late years steadily diminished, these animals still abound in outlying Governments, such as Olonetz, where any sportsman able to spare a month or more, and to afford the expenditure of a considerable sum of money, may still be certain of a bearskin or two.

Bear shooting is a winter sport, for without snow to track them in, these shy rovers are not easily found; luckily for the sportsman, however, the bear is a hibernating animal, and the first fall of snow not only drives him hurriedly to seek his winter-quarters, but also enables his enemies to track him to his chosen retreat.

Finding the Bear.—The usual method is for the local sportsman to sally forth about the first fall of snow, in November, either alone or with his dog; that is, if he has one endowed with the gift of silence. He knows from experience how to mark down each animal to the sanctuary in which it had hoped to sleep through the winter; and having made careful note of the whereabouts of a number of occupied *berlogi*, as these hibernating dens are called in those parts, he hastens with his secrets to St. Petersburg, where, as the bears are not likely to emerge when once they have settled down for the season, he is able to dispose of each *berloga* for a sum of from 40 to 70 roubles (£4 to £7), according to the estimated size of its occupant. It is not improbable that he will thus sell his whole batch of bears, from one to a dozen, to a single amateur, who will then, as soon as convenient, set out from town well equipped with heavy rifle and small arms, or, if he be of an enterprising disposition, with no more than a bear-spear, though the practice of engaging the beast so lightly armed is well-nigh obsolete.

He must drive to his destination, the vehicle being in all probability the *Kibitka*, a tented sleigh drawn by a pair of horses, the latter being changed *en route* at the post-stations. At the end of his journey, a matter of a week or considerably more, according to the distance traversed and the state of the roads, he will lodge at his guide's house; and, unless he is prepared to live on black rye-bread and *vodka*, with now and again a dried herring and a cup of weak tea, he should take with him a store of provisions.

[*From an original drawing by E. Caldwell.*

POLAR BEAR.

Snowshoes will be found necessary, but they may generally be had of his host, and those of Olonetz, shaped like Norwegian *ski* (long and narrow, and not after the Canadian model), are perhaps the very best obtainable.

Then comes the march for the nearest *berloga*, a function in which a trained dog is of use in supplementing his master's memory; and at last the supreme moment arrives when the sportsman stands, rifle in hand, at the den mouth, having secured good foothold for his snowshoes, in order that they may not slide at an awkward moment.

Meanwhile the guide, aided by his dog, if he has one, begins the work of driving the bear from its retreat, a feat accomplished by either sending in the dog to bark at and worry it, or stirring up the sleeper with a pole pushed through the frozen snow and piled brushwood that form the outer wall of its den.

[*Photo. by W. P. Dando, F.Z.S.*

RUSSIAN BROWN BEAR.

Sooner or later, a question of seconds or minutes according to the disposition of the tenant, the walls of the sanctuary will part suddenly and, with a roar of rage or a howl of terror, the bear will, in nine cases out of ten, bolt for the nearest cover. In the tenth case he will charge. Either way, this is the moment to fire, and, if possible, kill at a shot, otherwise an accident, or at best a long snow-chase, ending possibly in disappointment, will follow.

Spearing.—When bear-spears were in vogue, the sportsman would stand at the mouth of the *berloga*, receiving the brute's rush upon the steep-tipped point, and wrestle with the impaled monster until it succumbed. Sometimes the bear would succeed in hurling its assailant to the earth and tear savagely at his flesh before expiring.

Occasionally a bear is seen and shot in the vicinity of St. Petersburg, or a solitary marauder may at still rarer intervals fall to the axe of some peasant infuriated by the spoliation of his oat-patch or rye-field.

It may be convenient to offer a few hints as to the several ways of reaching Russia, and how to proceed when arrived there. Firstly, then, let the intending traveller provide himself with a passport, and let him have this properly *visé* by the Russian Consul, in Great Winchester Street, E.C. Armed with this necessary document, he may set out with an easy mind. St. Petersburg may be reached by sea or overland, as preferred. If the sea-route be chosen, there are frequent sailings from Hull during open navigation time—that is, roughly, between April 30 and October 30. It is advisable to obtain permission before attempting to pass firearms into Russia. Without friends in Russia, or introductions to sportsmen, it is difficult to obtain sport near St. Petersburg; intending shooters are therefore warned to make full inquiries beforehand, through friends in the country, to prevent disappointment.

FRED WHISHAW.

SCANDINAVIA.—The **Brown Bear** (*Ursus arctos*) of Northern Europe is distributed, though in gradually diminishing numbers, over the greater part of Norway and Sweden. It is, however, rarely, if ever, now met with south of latitude 59°.

Many hunters consider that there are two distinct kinds of Scandinavian Bear, whereas most naturalists are now agreed there is but one, though two skins are seldom found exactly alike. Some are black-brown, dark-brown, light-brown, yellow-brown, some grayish-brown with silver-tipped hairs, and others of a light yellow.

The Northern Bear retires into winter quarters about the middle or end of October according to the season, and at this period he falls into a lethargic state and ceases taking food. He comes out again about the middle of April, but this depends greatly on the season and locality. On first coming out, he is lean and scraggy, and has only ant grubs to depend upon for food, which cause his flesh to smell strongly of formic acid. At this time he greedily devours any putrid carcass which happens to be in the neighbourhood. Later in the spring and summer the alpine sow-thistle (called *Tort* by the peasants), angelica, and cow-parsnip afford him a good meal. Berries of every description from juniper to mountain ash, cloudberries (*Molte bœr*), wild raspberries, whortleberries, cranberries, crowberries, &c., wasp and wild-bee grubs and combs, beetles, slugs, frogs, shell-fish near the fiords, barley, oats, and rye in the peasants' clearings in the forests, to say nothing of cattle, sheep, and goats, all find a place in his bill of fare.

In Norway, bears are more or less numerous in North and South Throndjem, Nordland, Hedemarken, Nedenæs, Bratsberg and Romsdal, Amts, also in Sætersdal, Thelemarken, and Finmarken. In Sweden, in the forests of Jemtland, Dalecarlia, and Vermeland, and in Swedish Lapmarken generally.

Methods of Hunting.—Of the various modes of hunting and killing the bear, the most sporting way is with a good bear-hound in leash, in summer and autumn, accompanied by one follower only. In winter-time several dogs may be used to range the woods and find the "*Hie*" (winter lair), the hunters traversing the snow on "*Ski.*"

Dogs are absolutely necessary for the first-named mode of hunting, and prices ranging from five pounds to twenty-five are often given for a first-rate animal; an indifferent hound is worse than none at all. They may be bought in Jemtland and Ljusnadal in Sweden, and at various places in Norway. The dogs should be fitted with a light leather harness round the chest and shoulders, to which a leading strap three yards long should be attached. They are most intelligent animals, with remarkably good scenting powers, and will lead the hunter straight up to his game. They should never be beaten. Bears have a very keen scent, but neither their sense of sight nor hearing is so well developed. Should a bear once realise that he is being hunted, he will travel down wind in the most provoking manner all day, keeping a few hundred paces to leeward of you, and unless you can reverse the situation, it is almost hopeless to follow him. Being also a wonderful stayer and first-rate climber (though rarely climbing trees), he can beat any dogs at clambering up or down rocky hill-sides.

Haunts of the Bear.—During hot weather he lies up for many days at a time, picking out a cool, swampy dell in the recesses of the forest, where he makes several large holes in which he wallows like a hog. He also retires to the high ground, above the timber-line, and digs out a bed in a secluded snow-patch, where he will remain for days, safe from flies and mosquitoes.

Brown or Scandinavian Bear.

On cool days, with a northerly wind and drizzle, during August and September, he is out feeding, and the hill-sides where berries grow in profusion should be carefully scanned early and late.

When the first snow falls in mid October, the hunter has a good chance of tracking him and ringing him in his "*Hie.*" When this is found, it should be approached with caution and invariably up wind.

Stalking, &c.—Get as close as possible to a feeding bear, keeping above him all you can. If his broadside be toward you, aim just behind his right or left shoulder as the case may be. If he be running from you, shoot anywhere, at his rump or tail; load quickly, and fire into his chest as he turns round to charge. If below you, aim between his shoulders or loins, or at the centre of back. Should you suddenly come on a she-bear with cubs, kill the old one first; if the cubs escape, fix up the mother's carcass and wait near; you will then probably bag them also. In the event of shooting a cub at some distance from the mother, load immediately, and hide near the body, for she will certainly turn up sooner or later. Should she rush in on you, making a loud, angry "huff, huff," keep your nerve and shoot straight. Never approach a dying or apparently dead bear with unloaded rifle, but go up cautiously with both barrels at full cock. Do not smash the skull with your finishing shot, as one in the neck or behind the head is equally effective.

Measurements.—Scandinavian bears will ran up to nearly 900 lb. in weight, and a skin has been measured 9 ft. 3 in. long and 6 ft. wide. The largest shot by the writer weighed about 800 lb., having a skin 7 ft. 11 in., from nose to tail, by 4 ft. 8 in. in width. Thirty-five years is about the limit of age.

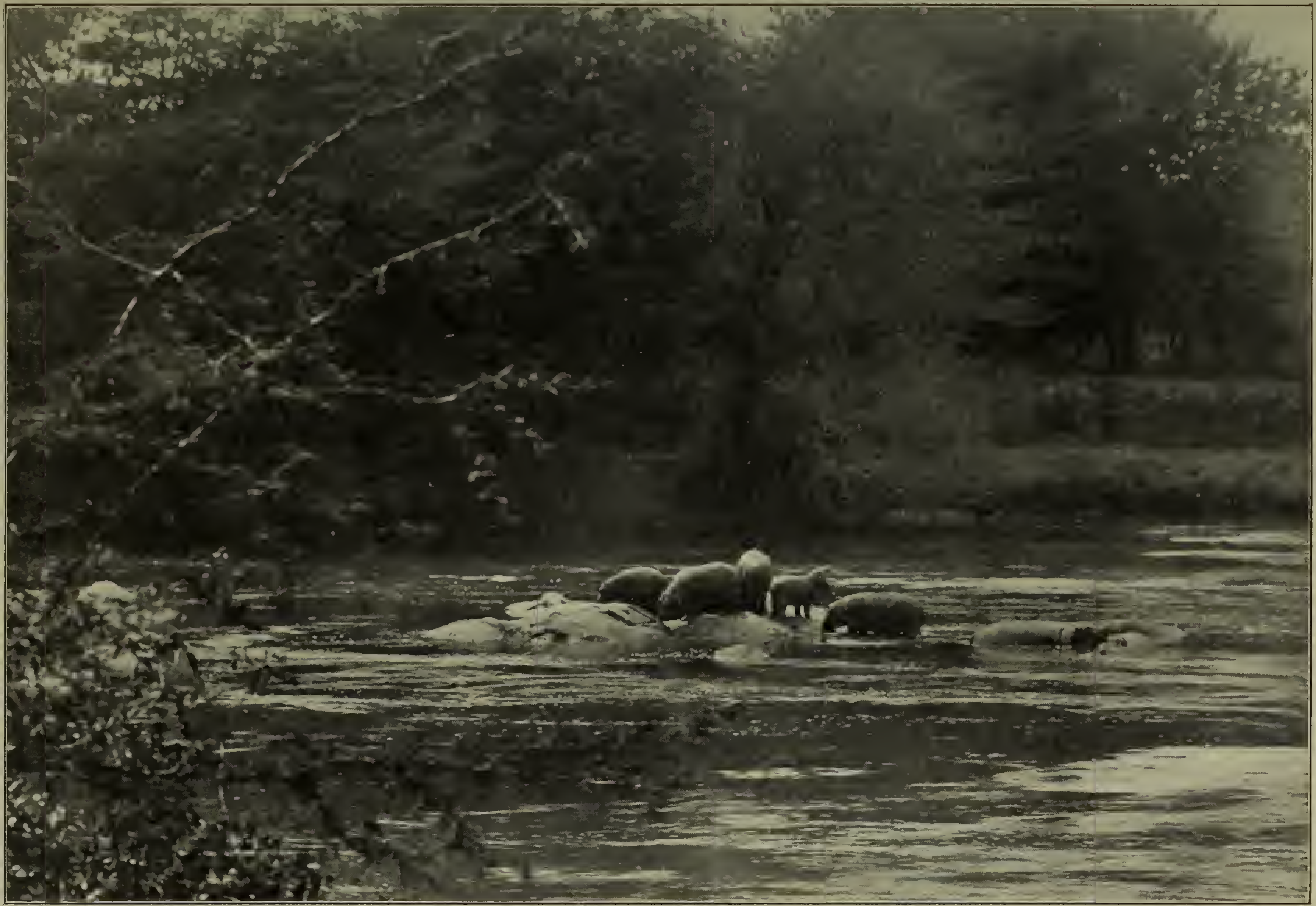
Guns and Ammunition.—A ·500 or ·450 express, by a good maker, firing a conical expanding bullet with a thick solid base and small, shallow hole at apex is a very useful weapon, being accurate at long ranges and effective at close quarters.

GERARD FERRAND.

BIG GAME.—

AFRICA.—Although shooting in Africa has vastly changed since Captain Cornwallis Harris (the forerunner of the great hunters) first entered the present Transvaal country in 1836, and discovered a wilderness teeming with game, where the sound of the rifle had never yet been heard, there is still, if the sportsman will travel far enough, plenty of sport to be got among the great fauna. But the wonderful plenty of what may be called the great game-slaying epoch—1836 to 1890—is not nowadays to be found except in a few remote and difficult places. The sportsman, then, must be prepared to work much harder, and to travel very far before he can find and bag big game. He will discover, as a general rule, that heavy game in Africa is much wilder and more suspicious than of old, and that its pursuit involves much more difficult hunting. Many species of game that fifty or sixty years ago grazed quietly in vast legions upon the open plains, and merely stared at the wagons as they plodded slowly across the Veldt, now drink by stealth during the night, feed across the flats at very early morning, and then betake themselves to the bush, where they find sanctuary during the hot hours. The mere pursuit of many of these animals frequently involves long and weary days in the saddle, starting from the wagons before sunrise, and often not coming up with the game until after several hours of steady spooring, which is undertaken by a native hunter or bushman. Perhaps another two hours are occupied in the actual chase, and the operations of skinning and cutting up, after which ensues a long ride of possibly another five or six hours back to the wagons. Not infrequently, after leaving camp at dawn, the hunter does not reach it again until dusk or even darkness has set in. To hunt successfully in South Africa nowadays, therefore, the sportsman should possess patience, endurance, an even temper, and a hardy frame. The actual shooting of the game, in itself not always an easy operation, is by no means the most difficult part of the business of modern South African hunting. The mere fatigue of riding under a burning sun for from eight to ten hours, or even more, day after day, over a rough, and often parched and waterless country, is no light matter. And even with good and willing native servants (not always to be counted upon), the labours of the day are by no means ended when the camp fire is reached. The skinning of specimen heads, and perhaps rare birds, which should never be entrusted to raw natives, cleaning guns, changing camera plates, writing up the diary, seeing that horses and dogs are fed, and many other necessary matters, have to be attended to before the wanderer can settle himself down by the fire, and enjoy in quiet his pipe and cup of coffee.

If, however, the sportsman is possessed of patience and a determination to succeed, he will find at the end of a week's hunting that his labours are becoming somewhat lightened. Every succeeding day hardens him and puts him in condition. The irksome detail of carrying a heavy rifle in the right hand during a long day while riding, which at first seemed so wearying, becomes a mere trifle as the muscles of the arm grow hardened to the task; and so with the rest of the labour. In some parts of Africa, where Tse-Tse fly abounds, and horses cannot be used, the fatigue of hunting on foot, no light operation in Africa, has to be faced. In these districts, however, bush and covert are more abundant, the game has been less disturbed, and shots are more easily obtained.



[*Photo. by A. Radclyffe Dugmore.*

Hippopotamus on the Rocks and in the Water on the Tana River.

Hunting-grounds and Game.—Thanks to the advance of railway communication in South Africa, the traveller can get within hail of his hunting-ground, at the present day, with far more ease and at considerably less expenditure of time and money than was formerly the case. It is not worth while lingering in Cape Colony, unless it be intended to shoot the smaller antelopes, such as springbok, klipspringer, steinbok, duiker, rhebok, bushbuck, and bluebuck, or in the Orange River Colony and Transvaal. If the sportsman is minded to shoot in Khama's Country, Eastern Matabeleland, and towards Lake Ngami and the Zambesi, his best plan will be to proceed by rail direct from Cape Town to Serowe (Palachwe Road) or Bulawayo, and fit out there. If he means to hunt in Mashonaland (Southern Rhodesia) he will do best to go on to Salisbury, and there procure his wagon, stores, and equipments; from Salisbury also can be reached the country between Beira and the Zambesi, one of the best hunting-grounds now left to South Africa. In this latter country buffalo are still found, and roan and sable antelope, eland, blue wildebeest, Lichtenstein's hartebeest, waterbuck, reedbuck, spotted bushbuck, inyala, kudu, pallah, tsesseby, Burchell's zebra, wart-hog, bush-pig, lion, leopard, and hippos are fairly plentiful, while elephant, black rhinoceros, and giraffe may be occasionally encountered. Hunting, however, must be performed on foot. All information as to outfit and cost of hunting in Southern Rhodesia, North-West and North-East Rhodesia can be obtained at the offices of the British South Africa Company, 2 London Wall Buildings, London, E.C.

North-West Rhodesia is one of the best game countries now to be found in Africa. This can be reached by the Cape Town to Cairo Railway, which carries the passenger as far as Broken Hill (rail-head) for the sum of £20 8*s.* 11*d.* first class, £14 14*s.* 2*d.* second class, or £8 8*s.* 1*d.* third class. From here also the magnificent sporting-grounds of North-East Rhodesia can also be reached. The game of these regions include elephant, rhinoceros, hippo, buffalo, Burchell's zebra, giraffe, eland, kudu, hartebeest, blue wildebeest, sable and roan antelope, waterbuck, lechwe, puku, pallah, sitatunga, tsesseby, reedbuck, bushbuck, duiker, steinbuck, oribi, grysbuck, ostrich, lion, leopard, hyæna, &c. In Khama's Country, Matabeleland, and Ngamiland, elephants and rhinoceros are for the most part shot out, but most of the above-mentioned species can be procured and the splendid gemsbok is also to be encountered. In South-West Africa, in German territory, especially in

[*Photo. by A. Radclyffe Dugmore.*

Two Rhinoceros about to Charge.

the Kaoko Veldt, and in the Ovampo Country, fair sport may be obtained. Behind Benguela and Mossamedes, in Portuguese West Africa, elephant, buffalo, lion, leopard, zebra (mountain and Burchell's), Penrice's waterbuck, lechwe, eland, roan and sable antelope, kudu, and other antelopes, as well as lion, leopard, and other carnivora are to be found. Here, however, bush is very prevalent, the country is difficult to work, native servants are bad and hard to get hold of, and neither wagons nor horses can be always reckoned on. Good sport can also be obtained in Portuguese East Africa.

[*Photo. by A. Radclyffe Dugmore.*

HERD OF GIRAFFE NEAR THE TANA RIVER.

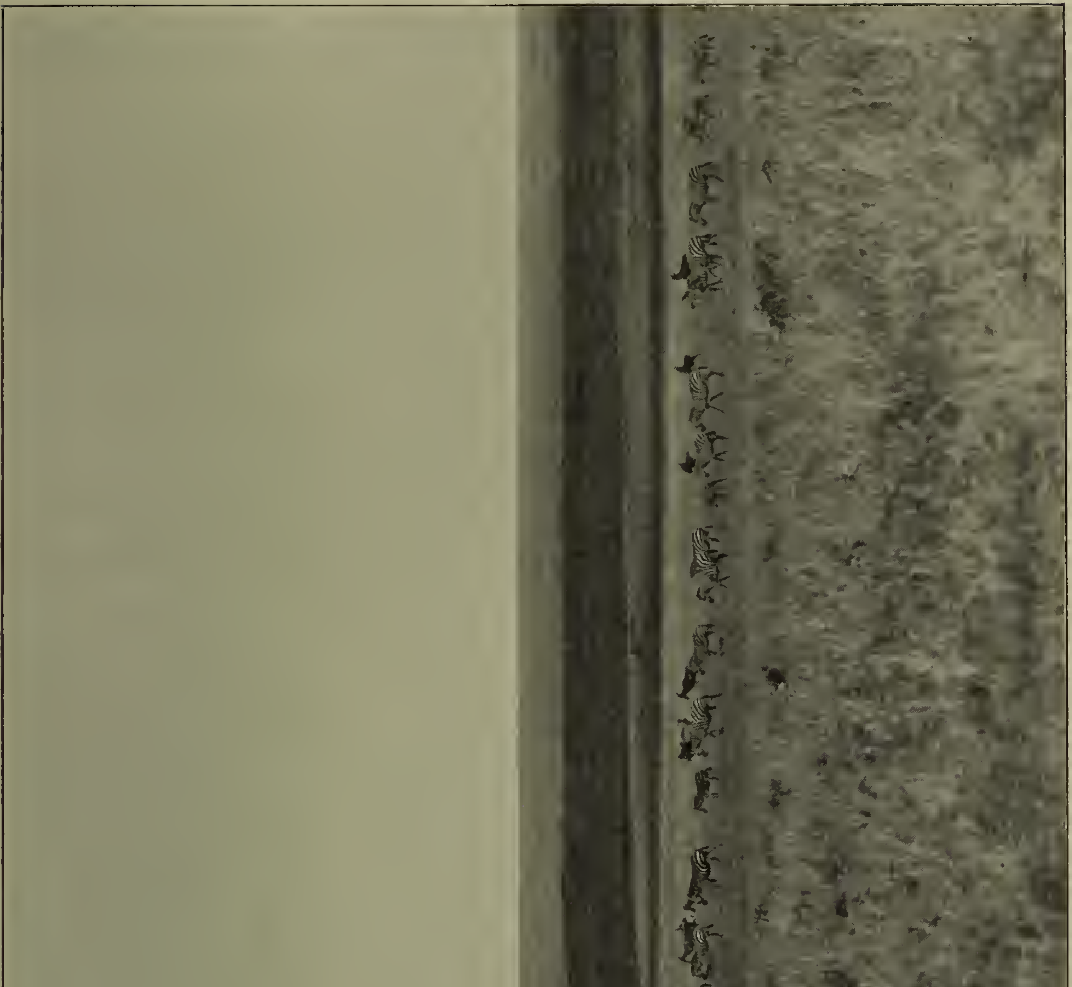
British East Africa is, of course, one of the finest game countries to be met with at the present day. Landing at Mombasa, the sportsman now finds much of his former difficulty of transport obviated by the Uganda Railway, which takes him right up to the best of the hunting-grounds, and puts him down at the most favoured spots. Nairobi, a rapidly growing town on the Athi plateau, is the best place to fit out from. In British East Africa, in addition to a large number of well-known antelopes, such as kudu, lesser kudu, various hartebeests, blue wildebeest, pallah (or impala), eland, waterbuck, and roan and sable antelope, are to be found the rare Hunter's antelope, oryx beisa and oryx callotis, Clarke's, Waller's, and Thomson's gazelles, sitatunga, bushbuck, bongo, reedbuck, klipspringer, duiker, steinbuck, oribi, lion, leopard, buffalo, giraffe, Burchell's and Grévy's zebras and ostriches. Elephants and black rhinoceros, as well as hippopotami, are in some parts numerous. But it is to be remembered that hunting has to be conducted mainly on foot, and, as a general rule, it may be stated that the climate, especially near the Equator, is more trying than in South Africa. Somaliland, where horses can be employed, is still a fair sporting country, where many species of big game are to be encountered. The White Nile and Bahr-el-Ghazel regions also offer fine shooting-grounds—with the drawback of a feverish and exhausting climate.

Outfit, Expenses, &c.—For hunting in all Africa south of the Zambesi, except in the Beira Country and a few districts close to the river itself, wagons, oxen, and horses can be employed. They can be used also in parts of North-West Rhodesia, in German South-West Africa, and at times in Portuguese West Africa. If the sportsman fits out in South Africa, say at Serowe (Khama's Town), Bulawayo, or Salisbury, he may reckon upon buying a good second-hand wagon outright for from £80 to

£110. Oxen will probably cost from £8 to £10 per head; good hunting-ponies from £40 to £70. Ordinary ponies, which can be broken to the gun, can be purchased in South Africa, at places like Mafeking or Serowe or Bulawayo, for from £25 to £35. The hire of a wagon and team of oxen or donkeys would cost in Southern Rhodesia about £1 10*s.* per day; a full span of oxen for a Cape hunting-wagon is eighteen. Donkeys are much slower travellers than oxen, and the latter are preferable. The wear and tear of horseflesh is very considerable, and each sportsman should take with him not less than three reliable hunting-ponies. If the hunting trip takes place in winter, the best season—from May to October—a "salted" horse, which is an expensive luxury, is not necessary. Mealies (Indian corn) should be carried on the wagon for the purpose of feeding the stud, and nosebags save waste and are always useful. When travelling among native tribes, mealies and Kaffir corn (millet) can usually be purchased. These vary in an average season from 10*s.* a bag (205 lb.) to 35*s.*, and occasionally more, in time of drought and scarcity. With each wagon are required a driver, whose wages should not exceed from £2 10*s.* to £3 10*s.* per month, and leader £1 to £1 10*s.* per month. Horse-boys get about £1 per month. A native cook should be secured for £3 10*s.* per month. All native servants have, of course, to be found in food, chiefly mealie meal and game meat. A small waterproof oblong tent is a useful thing, if the trip is to be a prolonged one. This can be lashed on to the buck-rail of the wagon. Every necessary article required for a hunting expedition (tea, coffee, sugar, tinned milk, tinned meat and fruits, mealie meal, Boer meal, pots, pans, &c.) can nowadays be procured at up-country stores at Bulawayo, Salisbury, Serowe, and Kalomo. In North-West and North-East Rhodesia it would probably be better to secure the services of an experienced white hunter, who would act as guide and transport-master, and undertake the whole outfit of the expedition. The British South Africa Company will furnish the names of reliable men undertaking such work. In North-West Rhodesia the cost of hire of a heavy and light wagon, and oxen, three horses, drivers, native servants and cook, including maintenance, would run to from £150 to £200 per month. This would be for a party of two, and the guide's own time and remuneration would be included. Where an expedition is conducted on foot, in Tse-Tse-fly country, for instance, where horses, oxen, and wagons cannot be employed, the cost should not exceed, for a party of two, £50 per month.

As regards other items of outfit, it is a mistake to use heavy saddles; light English saddles, furnished with plenty of "dees," and bridles should be taken out from England. Half a common cotton Kaffir blanket, folded small and placed under the saddle, saves horses many a sore back. Breeches or knickerbocker breeches of velvet cord, moleskin, or Burberry are best for the veldt. Strong brown boots and pigskin gaiters, or field-boots, are best for foot and leg gear. A broad-brimmed felt hat, plenty of flannel shirts, and a strong cord or Burberry coat for hunting in thorn or bush country, when following game on horseback, complete the outfit. The coat can be strapped on the saddle-bow, and a compass, a box of matches, and a full water-bottle should never be omitted when leaving the wagon in search of game. When hunting in Equatorial Africa, a sun helmet (the Khaki Service pattern is best) will replace the South African felt hat. A pair of light field-glasses should always be carried. A small case of medicines, preferably in tabloids (Burroughs and Wellcome's can be strongly recommended), in case of fever or dysentery, should be remembered. Corrosive sublimate or permanganate of potash tabloids, for treating sores and wounds, should be carried, and, if hunting beyond the Zambesi or in South-East Africa, a fine-mesh mosquito net should also be taken. When hunting in the waterless deserts of the Kalahari and Western South Central Africa, where the loss of one's horse may mean disaster, it is a wise plan to secure one's mount to the hunting-belt by means of a cord or thin hide *riem*, the other end of which is made fast to the cheek-ring of the bridle. With a little practice, a South African horse will almost always stand quietly for the shot. A few mongrel dogs are useful for baying lion, leopard, or other dangerous game, and guarding the wagons. A pointer should certainly be taken for finding feathered game. It may be noted that at the end of a hunting-trip the whole outfit, including wagons, spare rifles, horses, and stores, can usually be sold, for about the price paid for them, on the hunter's return to a frontier town and semi-civilisation. With average luck and judgment, therefore, a South African hunting expedition need entail nothing like the extravagant expenditure hinted at by luxurious travellers.

It is a good thing to take green rotproof canvas sacks for scalps and skins of game. These, when dry, should be sprinkled with



[Photo. by A. Radclyffe Dugmore.

A Large Herd of Grant's Zebra and Coke's Hartebeest on their way to Water.

naphthaline, and the sacks carefully sewn up. They are then practically insect proof. If the expedition is away for a long period, the skins should be gone through again before shipping for home.

In East and Central Equatorial Africa the cost of hunting is a good deal increased by the number of native carriers required to convey stores, ammunition, guns, and camp equipment. The Uganda Railway has, however, obviated some of this expense. The actual cost of an expedition of some length would probably work out at something like £80 or £100 per month, if a man were hunting alone. If headquarters were made at Nairobi, and short trips taken from the railway, the expense would be considerably less. At Nairobi, at the present day, most of the necessary stores can be procured, and competent hunters, who will undertake entire charge of the expedition, are also to be obtained. Many experienced sportsmen, however, still prefer to take all stores out from England. It is to be remembered that a considerable reduction in customs duties is made on goods sent as freight. All stores, such as provisions and ammunition, should be packed in 55-lb. or 60-lb. cases. If the cases measure 24 ins. by 14 ins. by 19 ins., they can be carried with equal convenience by men or donkeys. Trade goods, for barter and payments, can be conveniently bought in East Africa. In Somaliland, which is reached from Aden, camels are used for crossing the waterless desert which separates the coastline from the hunting-country.

Battery.—We come now to that most important subject, the choice of weapons. For any part of Africa, at the present time, a useful battery would be the following:—

(1) A ·400 double smokeless-powder (axite or cordite) Express rifle, accurately sighted for shooting on the plains. This is a most useful weapon for all-round sport, from elephant or rhinoceros to a springbuck or gazelle.

(2) A Mannlicher sporting rifle, ·256 calibre; magazine action; 5 shots. As a light weapon, weighing no more than 7 lb., this rifle, for all ordinary game, is very hard to beat. It has an extremely low trajectory, and shoots with great accuracy up to 400 yards. For stalking, in plain or hill country, it is a most excellent weapon.

(3) A 12-bore ball- and shot-gun of modern and improved type. These guns are extremely useful in bush or jungle, when in pursuit of dangerous game. They are as handy as a shot-gun and need weigh no more than 7 lb. Westley Richard's "Explora" is a first-rate weapon of this type. It has great smashing power, good penetration, and carries accurately up to 300 yards. It can be used as a shot-gun, if required.

(4) A 12-bore shot-gun for bird shooting.

Such a battery would be sufficient for all needs of the present day in Africa; and if the writer were starting for the hunting-veldt to-morrow, he would desire no more complete outfit in the shape of guns and rifles. An alternative battery might be chosen as follows:—

(1) ·450, ·465, or ·470 smokeless Express.
(2) ·275 Mauser-Rigby sporting magazine rifle.
(3) "Explora" ball- and shot-gun.
(4) 12-bore shot-gun.

If, however, the sportsman desires a weapon of yet heavier calibre for use against such formidable game as elephant, rhinoceros, and buffalo, he can make use of a ·600 smokeless Express, which gives a velocity of rather more than 200 feet per second, and has the enormous striking force of 8,700 foot-pounds, or about 1,700 lb. more than the heavy four-bore rifle formerly in use. Such a weapon can be relied upon to stop or turn the charge of an elephant at close quarters. At the present day, however—so great has been the extension in the power of rifles since the introduction of smokeless powder and improved bullets—the average hunter is content with no heavier weapon than a ·450 or ·500 rifle, even against the most formidable and dangerous of game. Armed with such a weapon, and with a really good ball- and shot-gun, such as the "Explora" or "Paradox," carried in reserve by a reliable gun-bearer, the sportsman need by no means be afraid to tackle elephant, rhinoceros, buffalo, or lion in bush or forest country.

For stalking antelopes and other game on the plains, or in hill country, great improvements have, in recent years, been made in sighting. Good aperture backsights can be fixed at very trifling cost; these greatly increase accuracy in shooting, and are a very distinct advantage at either moving or stationary objects. A still greater improvement is the telescope sight, which can be readily affixed to the rifle, and for long range stalking enormously increases the shooting powers of the gunner. Great care, however, should be taken in the selection of such a convenience, and only those to be obtained from high-class rifle-makers, whose telescope-sights have been well proved in the field, under the rough and ready conditions of foreign sport, should be chosen. Messrs. John Rigby & Co. and W. J. Jeffery & Co. have acquired well-deserved reputations for these sights.

Hints on Shooting.—As regards the actual shooting of game, it may be said that only experience in the field can teach a man the knowledge of which he stands in need. Spoorers and native hunters may be relied upon to take the gunner up to the game he seeks; the rest of the business lies entirely with himself. In shooting lions, leopards, and other thin-skinned game at close quarters, the modern smokeless-powder rifle, preferably of a calibre of not less than ·350, in conjunction with an expanding bullet, is a very deadly weapon. A broadside shot through the heart or lungs, or a chest shot, if the beast is facing the gunner, is pretty certain to kill or turn dangerous carnivora. The frontal head shot for elephants, often resorted to in the East, is not so frequently relied upon against the African elephant, which has a more convex skull. Since the introduction of the modern high-velocity rifle and smokeless powder, however, African elephants have often been killed in this way, even with bullets of such slender calibre as the ·303. A much safer shot with African elephant, however, is that between the eye and the ear, when the brain is pierced with a well-directed bullet. With these enormous beasts, however, a heavy-calibre bullet, directed at the heart or lungs, is the safer shot. Rhinoceros are, as a rule, not difficult beasts to kill, and are often surprised and slain at close quarters; a shot from a ·450 to ·577 rifle, or a twelve-bore—using the solid bullet—through the heart, lungs, or neck vertebræ, may be confidently relied upon to bring this gigantic game to bag. In shooting heavy game, most beginners usually make the mistake of firing too high for the vital parts. The aim should be, if possible, directed just behind the point of the shoulder, a trifle below the middle of the body. A shot through the neck vertebræ of any formidable animal is instantly disabling. It should always be remembered that for thick-skinned game, such as elephant, rhinoceros, buffalo, and giraffe, only solid bullets should be used.

Game Laws and Licences.—It is to be remembered that Game Laws now obtain in all parts of Africa. Wherever the sportsman may direct his steps, he has not only to pay a licence, usually varying from £25 to £50, but is very properly restricted in the number of head of game that he may shoot. Game regulations vary in different countries, and are frequently being added to or altered. Broadly speaking, it may be said that for a £25 licence the gunner will be allowed to shoot several specimens of most of the numerous antelopes of the country, as well as zebra, wart-hog, bush-pig, lions, leopards, and other carnivora. If he desires to shoot elephant, rhinoceros, giraffe, buffalo, and a few of the rarer antelopes—of course, in restricted numbers—he will have to pay a £50 licence. In East Africa, at the present time, on the £50

[*Photo. by A. Radclyffe Dugmore.*

HERD OF GRANT'S GAZELLE.

licence, which lasts for one year from the date of issue, the gunner may shoot two elephants (tusks to weigh not less than 60 lb.), one buffalo, two rhinoceros, two hippos, two zebra, two oryx callotis, two oryx beisa, one roan antelope, one sable antelope, two kudus, two topi, ten Jubaland topi, two Neumann's hartebeest, one bongo, ten Grant's gazelle, ten Thomson's gazelle, ten Jackson's hartebeest, ten Coke's hartebeest, ten impala, ten reedbuck, ten duiker, ten klipspringer, ten waterbuck, ten wildebeest, ten bushbuck, ten paa, ten lesser kudu, ten gerenuk (Waller's gazelle), two cheeta. Lions and leopards are here, as in other parts of Africa, classed as vermin, and no licence is required to kill them.

Caribou.

In North-East Rhodesia—a fine hunting-country—the Game Laws are the most liberal in Africa. Here, with a licence costing no more than £2, the sportsman may shoot hippos, buffalo, sable and roan antelope, kudu, waterbuck, reedbuck, impala, sitatunga, puku, lechwe, inyala, chevrotain, and various other small antelopes, as well as wart-hog and bush-pig. With a special licence, costing £25, elephant, rhinoceros, eland, wildebeest, and zebra may also be obtained. In North-West and Southern Rhodesia the £25 licence covers buffalo and most of the large antelopes. Special permits, costing another £25, have to be obtained from the Administrator to shoot elephant, rhinoceros, giraffe, and some few other species of rare game. In North-West Rhodesia, however, the ordinary £25 licence enables the holder to shoot three eland bulls, one kudu bull, five bulls and three cows of the sable antelope, and three zebra. In Southern Rhodesia, under an ordinary £1 gun licence, not only may all the numerous game-birds be shot, but also all the smaller antelopes, such as klipspringer, steinbuck, duiker, &c.

It would be impossible, within the space of this article, to refer at length to the various game regulations in other parts of Africa. The above instances give a fair idea of what the gunner may expect to pay in the way of licences. But before proceeding to any particular district or territory, it will, of course, be necessary to become thoroughly acquainted with the existing game laws. In South and South Central Africa, including South, North-East, and North-West Rhodesia, the shooting season extends from the beginning of May to the end of October. In East Africa from May to the end of January is the proper time for a hunting expedition. It should be noted, however, that in this region rain may be expected in October and November.

H. A. Bryden.

AMERICA, NORTH.—With the exception of British Columbia, the North American continent is, in spite of a few remaining districts where good sport may still be had, practically played out from the sportsman's point of view. In British Columbia the sportsman must be prepared for downright hard work in a dense, rugged country. Here we shall find in far greater quantity than elsewhere every description of game common to the States, save the Prong Buck, to compensate for which we meet the true Black Tail deer, unknown in any part of America except along the Pacific coast.

Wherever we strike into the mountains, game of some description is nearly certain to be found. But the country is frequently so densely timbered, that little can be seen. Of well-known districts not yet exhausted, East Kootenay is the best and very easy of access. Here can be obtained in a three months' trip Caribou, White Tail, and Mule Deer; the Rocky Mountain Sheep; the Black and the Grizzly Bear; also the wretched Rocky Mountain Goat, which never can realise its danger. Here, too, lives one of the very few professional hunters of British Columbia. Every one must first gain his experience under a good hunter; and then, if he feel equal to it, let him start out northwards on his own account.

The Woodland Caribou (*Rangifer tarandus*), the female of which carries antlers, is distributed throughout British Columbia as far north as the head-waters of the Fraser River, where it gives place to the Moose. Further north, and inland, we come to the Barren Ground Caribou (*Rangifer grœnlandicus*).

Continuing still further north, we fall in with Bison; and finally meet the Musk Ox, which is only to be secured by some more than usually tough and enterprising sportsman. Those who hunt the Woodland Caribou should do so in the northern districts in September and November, for they shed their antlers remarkably early. They are very keen of scent and hearing, though, if the hunter succeeds in getting into a band of them, they appear to lose their heads and can be shot down right and left. They are also very locally distributed.

The mountains of the western side of the Kootenay Valley hold only Caribou and Mule Deer, while those on the east contain no Caribou at all, but plenty of Sheep, Goats, and Deer.

The Wapiti (*Cervus canadensis*), commonly known as Elk in America, is a magnificent deer formerly abundant in the States, but fast becoming scarce. At the present time, a specimen head is as likely to be procured in Wyoming as anywhere. The Wapiti is easily stalked and easily killed. It carries its antlers throughout the winter. There are a few examples in Kootenay and plenty on Vancouver's Island, but insular heads run small.

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A HERD OF AMERICAN BUFFALO (BISON).

The Mule Deer (*Cariacus macrotis*), known in America as Black Tail deer, is, after the Caribou, the most widely distributed and plentiful deer of British Columbia and the States. Its habitat in

British Columbia extends on and off from the extreme south to Stuart's Lake in the north. Its antlers vary in formation and beauty considerably, and the hunter may always hope to kill yet a finer head than the last. Around Quesnell, on the Fraser, is a favourite locality. It is easily hunted and very plentiful in East Kootenay.

The beautiful White-Tailed Deer (*Cariacus virginianus*) have, perhaps, the widest range of any deer in the world. They penetrate from the Atlantic to the Pacific, but do not extend far north in British Columbia. They are very abundant in East Kootenay, and are well worthy of all the hunter's skill, which in fair stalking will be taxed to the utmost.

Wapiti Stag and Herd.

The Black-Tailed Deer (*Cariacus columbianus*) are unknown save along the Pacific coast. They never wander far inland. From Vancouver into Alaska, many islands and the whole coast abound with them. They are easily approached.

The Moose (*Alces machlis*), known in Europe as the Elk, is the largest and most ungainly deer in the world, and one hideous head should suffice to satisfy most hunters. They are not difficult to obtain either in Canada or a district north-west of Winnipeg, but a whole season given up to their pursuit would be wasted, so far as the prospect of obtaining other game is concerned.

The Prong Buck (*Antilocapra americana*) is exclusively confined to the southern prairies, and even there its numbers are rapidly decreasing. It is hunted with dogs, but affords good stalking and requires straight shooting. It has the peculiarity of shedding its horns about October.

Throughout British Columbia comparatively few mountains are without the Rocky Mountain Goat (*Haploceros montanus*), but these tame, foolish creatures afford no sport save the risk of a broken neck. The hunter has only to discover one to secure it, and by the time he has butchered the first, he will probably consider a second not worth climbing after. Fuller particulars as to the habits of the more important of these beasts are given under special articles.

Hints on the Trip.—Unless the sportsman is content to risk entire failure, or only possible success, in some unknown district, he should, before leaving home, obtain information as to the latest discovery of a good locality for sport, and then secure a reliable hunter. All else is plain sailing. The best route to British Columbia is *via*

New York, and on to Montreal and westward by the Canadian Pacific Railway. Little game exists east of the Rocky Mountains. If a good hunter be secured, the sportsman need not trouble himself about anything save rifles and clothing. All can be obtained with the hunter's assistance at the last town or Hudson's Bay port, where the hunter should be in waiting.

Expenses, &c.—The cost of a three months' trip would be, for a hunter £2 per day, to include horses and outfit, and cook £10 per month; in addition to these, a suitable supply of cheap provisions, such as flour, rice, canned milk, coffee, sugar, salt, &c., must be taken.

Season.—The sportsman should leave England about the 15th of August and must, if hunting in British Columbia, first procure a £10 licence.

Shooting Memoranda.—When stalking any animal on a mountain side, the hunter should circle round to leeward and get above it, especially when after Bighorn.

By taking up a position between the setting sun and an animal, it can be easily approached unseen. On coming suddenly upon game, should it not be too much scared, it is best to remain perfectly motionless, until it commences to feed, or looks away. The most timid deer will often pass within ten yards of a stationary person without suspicion. A wounded animal should not be followed immediately, but rather be given time to lie down and stiffen. It is advisable to hunt only early and late, resting, as do the animals, in the middle of the day. When upon the hunting-ground, shots should never be fired at winged game, or anything save good heads. The sportsman should learn to skin before going on a hunt, and do all such work himself if the trophies are to look their best. Skins should *not* be dried in the sun or before a fire; and plenty of neck skin must be left on the masks of deer. A good deerhound will find much game and seldom lose that which is even slightly wounded, but he must always be fastened to the belt. Careful bearings should be taken on leaving camp, and if the hunter be lost, there is no need for alarm; it is only the camp that is lost, for a man with a rifle should always be able to exist until he either find his camp or be found. Two shots fired rapidly are usually considered signals of distress. More than one hundred rifle cartridges are unnecessary, and they should never be lost sight of or given over to any official on the way out. It requires an especially strong box to resist the rough handling of porters; and great care should therefore be taken in packing rifles.

Requirements.—A Winchester is the rifle of the country; it is good and cheap, and cartridges can always be obtained; but the most perfect and satisfactory weapon is a double ·500 hammerless ejecting Express. If geese and ducks are likely to be met with *en route* to the hunting-ground, a Paradox is advisable; its possession likewise renders any mishap to the rifle of little consequence. A revolver is useless. The best way to carry a rifle is in a sling over the back.

A Young Moose Swimming.

As for the remaining requisites, ordinary winter clothing will be wanted, as well as about five pairs of common sand-shoes with thin rubber soles, which are the most comfortable and noiseless for climbing and stalking.

A strong leather belt with two knives, whetstone, and compass, as well as a good pair of field-glasses, are necessary. An excellent skinning- and hunting-knife is made,

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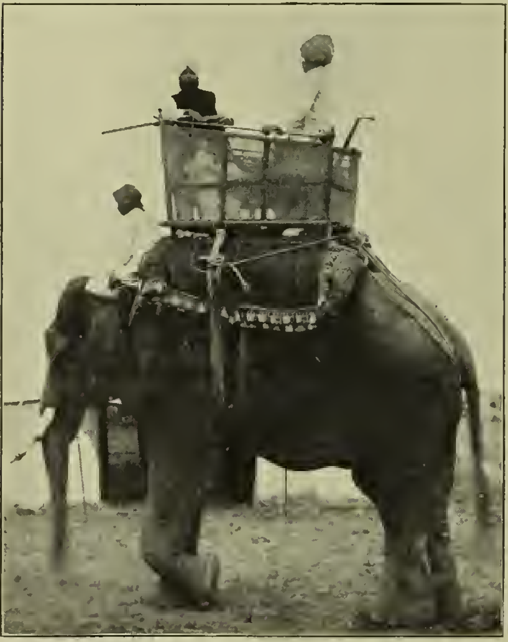
Young Rocky Mountain Sheep.

the handle of which closes on the blade; the latter fits neatly into a sheath. A second knife should be carried, commonly known as a shoemaker's knife, the blade of which has an upward turn; it takes a rough edge, and is excellent and quick for skinning. A roll valise is very handy for sleeping upon and carrying blankets, &c. The sportsman should be careful not to burthen himself with more than he absolutely requires, and that is very little. A fishing-rod and large trout flies will often come in handy.

J. TURNER TURNER.

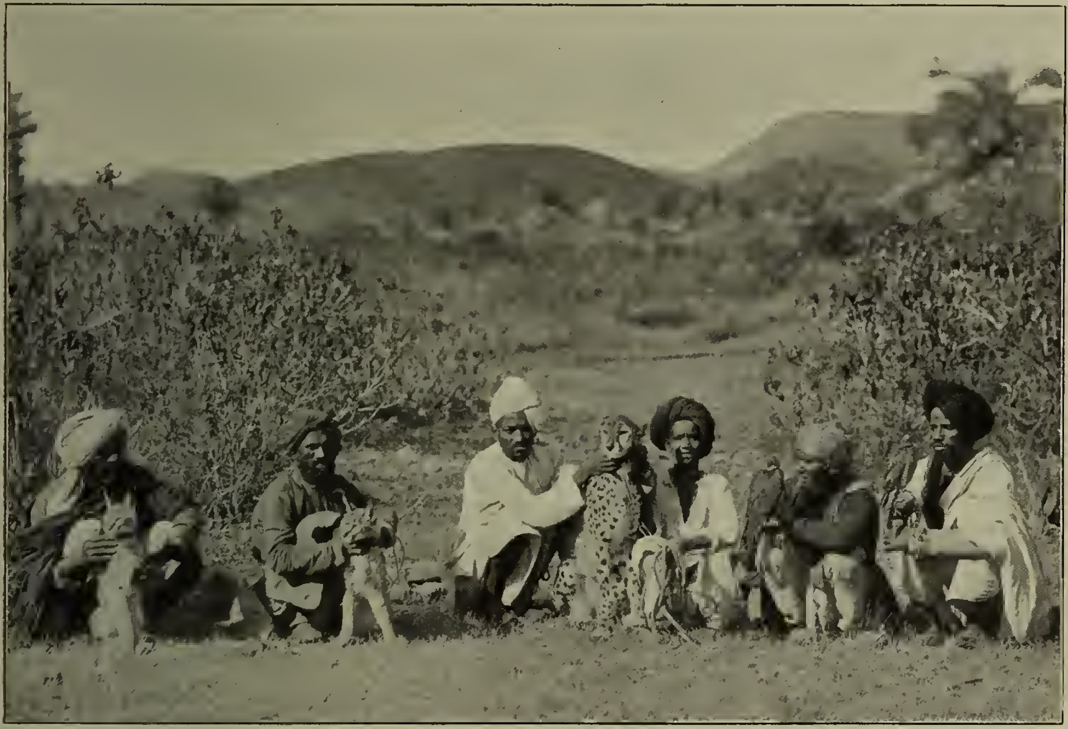
INDIAN.—India affords as large a variety of animals for the rifle as any country in the world. Some of them are not met with elsewhere. Tiger, Panther or Leopard, Bear, the Gaur (always called in India Bison), Buffalo, Sambur, Swamp Deer, Cheetul, Hog Deer, Barking Deer, Nilgai, Black Buck, Gazelle, Four-horned Antelope, Neilgherry Wild Goat (called in India Neilgherry Ibex), Rhinoceros, and Elephant, are the principal animals in India. In the Himalayan ranges, there are the Markhor, Ibex, Serow, Tahr, Gooral, Shapoo or Oorial, Burrel, Snow Leopard, Musk Deer, Brown and Himalayan Black Bear, and Cashmere Stag. In the hills to the west of Sinde are a wild goat (*Capra ægagrus*), the same animal that is found in Crete and the Caucasus (it is known to Indian sportsmen as the Sinde Ibex), and a variety of the Markhor with a straight horn having a spiral twist. The Striped Hyæna, Wolf, Indian Wild Dog, Cheetah or Hunting Leopard, the Lion, Lynx, Wild Ass, and Wild Boar complete the list of what are usually styled the "big game" of India, though, to the old shikari, the smaller deer and antelopes are not reckoned as such.



INDIAN ELEPHANT, SHOWING SHOOTING HOWDAH.

CHEETAH.

The Indian Lion is now represented only by a few animals in Kathywar. They are very properly preserved and not shot, except occasionally by some one specially privileged to do so. The writer sees no difference between the Indian and the African Lion and believes them to be identical. Tigers, Panthers, and Bears are found throughout India, generally speaking, though there are many thousands of square miles without any, and a stranger to the country, unless he has information as to the exact localities and the assistance of some experienced friend, could easily spend months without seeing a single example. All the large mountain ranges of the Indian Peninsula hold the Indian Bison: the Satpoora and Vindhyan ranges, the Mysore and Travancore Hills are the best. The Buffalo is found only in Assam, parts of Bengal, and certain limited portions of the Raepore, Sambalpore, and Chanda districts of the Central Provinces. Sambur, Cheetul, Swamp Deer, and Hog Deer are jungle deer, the two former being found in suitable localities throughout India. The range of the Swamp Deer is more limited, its principal habitat being in the heavy grass and forest land in Assam and the foot of the Himalayas. It occurs also in the Mundla, Raepore, and Sambalpore districts of the Central Provinces. The Hog Deer is found in Sinde, Assam, and Northern India; but does *not* extend, as stated by Jerdon, into Central India. The Barking Deer is also a jungle deer, and is found throughout India. Of the Antelopes, the Black Buck lives in the plains; the Nilgai in the jungles and also in the open country; the Four-horned Antelope in the jungles; the Gazelle in the jungles and in open ground. The Neilgherry Ibex only occurs in the Madras Presidency, in the Neilgherry and Annamallay Hills, and in Travancore. The only other member of the same genus (*Hemitragus*) is the Tahr or Himalayan Wild Goat. The Elephant is still numerous in Travancore and Mysore, and in the large forests at the foot of the Himalayas. It is not now found in Central India. Shooting Elephants is prohibited in British territory. In the native states of Travancore and Mysore, also, they cannot be shot without permission from the State. There are two kinds of Rhinoceros, the larger and lesser. The former occurs in the Terai and Assam, and the latter in the Bengal Sunderbunds. The Wild Ass is only found on the Rann of Cutch, and is not shot. The Hyæna is also not an object of sport, and is common. The Wolf and Wild Dog are not uncommon, and are found throughout the country; the former generally in the open country; the latter do not leave the jungles. The Hunting-Leopard is not often met with when out shooting. Some of the native Rajahs keep them for coursing Black Buck. The Lynx is also seldom seen. Jerdon states that it is unknown in the Himalayas and in Bengal. That it occurs in Sinde is certain, as one was pulled down there by a couple of greyhounds belonging to a friend of the writer. The Wild Boar is found throughout India. In all suitable localities it is killed with the spear only.



CHEETAH, HAWKS, AND LYNXES USED FOR HUNTING BIG GAME.

Season.—The best season for Tiger, Panther, and Bear-shooting in Western and Central India is March, April, and May; after the monsoon breaks, usually in the second week in June, nothing can be done. The jungles are then very feverish till about the end of November. In December, January, and February, which are the best months in the writer's opinion for stalking Deer, the jungle is too thick and the water too plentiful for much to be done with the *felidae*, though some can, no doubt, be procured at that season. Bison and Buffalo-stalking on foot, which is the only sportsmanlike way of attacking these animals, is best followed in April and May, and for three weeks, or a month, after the rains commence. In Northern India, where the long grass necessitates the use of elephants, the shooting is generally done in the hot weather, March to June. In Southern India, on the other hand, the feverish time in the hills is the hot weather, and October and November are safe, although much discomfort is experienced from the rain. In the hot weather the stags have mostly shed their horns, and about Christmas is the time to stalk them. In the Central Provinces, rules have been framed which establish a close-time for Deer, and this includes the hot weather. A copy of such rules should be obtained from the Secretary to the Chief Commissioner, Central Provinces, by all who wish to shoot in the Central Provinces. Large tracts of country, forest reserves, are also closed to sportsmen in the Central Provinces; and in other parts also it is necessary to obtain permission from the forest officer in charge to enter the jungles for shooting.

[*Photo. by W. W. Roach*

INDIAN BLACK BUCK JUMPING.

Equipment.—For big game shooting it is necessary to have one horse at least, and it is better to have two for each gun. As in hot weather it is much cooler in the open air than in a tent, an 80 lb. Cabul tent for each sportsman is sufficient; this will keep things dry in case of the rain and heavy thunderstorms that sometimes occur at this season. A double-barrelled ·500 Express rifle is all that is necessary, but for a battery, the writer recommends two ·500 Express rifles, an 8-bore gun built for ball (not a rifle: a gun is as good and not so heavy) and a 12-bore gun. Bullock-carts can be hired by the month at about 12 annas a day. Beaters' pay varies in different places, from 2 to 4 annas a day. It is usual to give *double* pay if a tiger is killed. The shikaris' pay is from 4 to 8 annas a day. The rewards given by Government for tigers, &c., killed, should be distributed among the shikaris and men. (The Indian rupee equals 16 annas, and at the present rate of exchange is equal to about 14 pence.)

MEASUREMENTS.—Probably no subject has given rise to more controversy than the measurements of animals which, in hunters' parlance, are classed as "Big Game," and of trophies of the chase. The reason for this is not far to seek; for the question is dominated by that exceedingly elastic quantity, the personal equation. Sportsmen, generally, are not too exact in their methods of calculating size or weight, and this inexactitude may arise, not so much from pardonable anxiety to secure a trophy whose weight, length, or girth will rival or exceed that of any other particular trophy, as from the difficulties which attend the exact mensuration of animals killed in situations such as confront the adventurous hunter all the world over. Nevertheless, the means to greater exactitude in measurement are simple in the extreme, and may be summed up by saying that with a five-foot rule, a two-foot rule—some part of it divided into millimetres—a tape-measure of any length over ten feet, a large pair of calipers, and a notebook and pencil, one ought to be able to achieve absolute accuracy.

At present, few of the tables of measurements found in books of sport detail the methods adopted. Some sportsmen measure along all the curves of a carcase (even pressing the tape into inequalities), whilst others measure in a straight line. Obviously, the difference between the two methods sometimes amounts to feet—a serious matter when the measurements of two animals, each taken by a different method, are compared, and therefore the method adopted should in all cases be stated: otherwise, confusion worse confounded arises when it is sought to institute comparisons.

Perhaps an indication of what the present writer considers a proper method of measurement may be acceptable to sportsmen generally. For ordinary mammals the method should be to measure, as shown in the diagram, Fig. 1, which is that of the Leucoryx Antelope (*Oryx leucoryx*).

In a direct line along back from tip of nose to end of tail.

The same along under surface from end of lower jaw to end of tail.

Length of tail, measured underneath from anus to tip, the deduction of which gives the length of body above and below.

Length along top of head, following all curves from nose to just behind and between ears.

Length from proximal angle of nostril to distal angle of eyelid on dotted line A.

Length between distal and proximal angles of eyelids.

Length from proximal angle of eyelid to insertion of ear on dotted line B.

Breadth of head between eyes.

Breadth between ears.

Length and breadth of ears.

Girth around muzzle at proximal angle of jaws (C, C).

Girth around muzzle in front of eyes (D, D).

Girth around head, under throat, in front of ears (E, E).

Girth of neck behind ears (E, F).

Girth of neck in front of shoulders (G, G).

Length of neck, on upper surface, from back of ears to distal edge of shoulder (F, G). Also, on under surface, from throat (E) to point G.

Girth of body just behind fore limbs (H, H).

Girth at greatest depth of abdomen (I, I).

Girth just in front of hind limbs (K, K).

Length of body between posterior edge of fore, and anterior edge of hind limbs.

Extreme length along *side* from throat (E) to below spring of tail (M).

Extreme height from ground to shoulder or withers.

Extreme height from ground to above hip.

Length of limbs as separate items where practicable.

Girth of limbs in three places: at foot, knee, and junction with body.

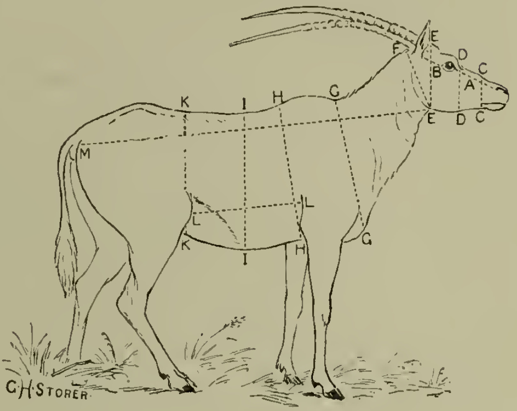


FIG. 1.

Note colours of muzzle, eyes, and all soft parts, and also any peculiarities.

The weight, if possible, to be recorded, and in many cases this may be calculated by the method detailed in certain works for ascertaining the weight of cattle.

Place and date in all cases to be given.

If a horned head, the position of horns in relation to the muzzle, eyes, and ears should be noted, and the width on top of head between their insertions.

The antlers of such an animal as a stag should be measured as shown in the diagram, Fig. 2, drawn from the horns of a Wapiti (often misnamed "Elk").

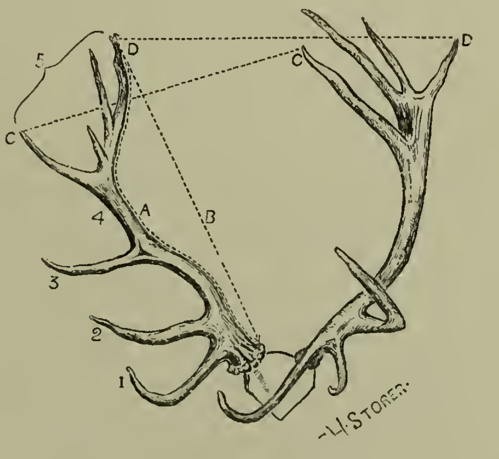


FIG. 2.—ANTLERS OF AN ELAPHINE DEER.

1. Brow-tine. 2. Bez-tine. 3. Tres-tine. 4 Royal-tine. 5. Sur-royals.

Length of beam of each antler, following all curves along back of beam to tip of highest posterior tine (see dotted line A).

Length in a straight line from burr to tip of same tine (see dotted line B).

Length along centre of beam to crown.

Distance from burr to spring of first or brow-tine.

Length of brow-tine along under surface.

Distance between brow-tine and next or bez-tine.

Length of bez-tine.

Distance between bez- and tres-tines.

Length of tres-tine; and so on, measuring length of each successive tine, and distance from this to next. Also note if any anterior sur-royal makes, with the beam, a greater length than that along the dotted line A.

Span between burrs.

Span between tips of brow-tines.

Span between tips of bez-tines.

Span between tips of tres-tines.

Span between tips of anterior sur-royals on dotted line C, C.

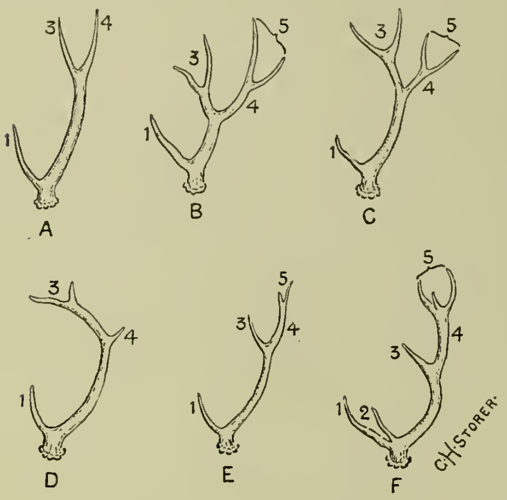


FIG. 3.—TYPES OF ANTLERS (modified from P.Z.S.).

A. Rusine type.
B. Normal Rucervine type.
C. Intermediate Rucervine type.
D. Extreme Rucervine type.
E. Sub-Elaphine type.
F. Elaphine type.

Span between tips of posterior sur-royals on dotted line D, D.

Greatest span at crown.

Girth of beam at burr.

Girth between brow- and bez-tines.

Girth between bez- and tres-tines.

Girth between other tines.

The length and girth of any other noticeable tines should also be taken.

It should be noted that the apparent beam above the tres is the "royal tine," and that all points springing therefrom are called sur-royals, anterior and posterior, and often form a cup—the "throstle's nest" of the Scot. Six points on each antler constitute a "royal head." In horns of other than Elaphine deer there is no bez-tine, and the next anterior one above the brow-tine is, therefore, the tres (sometimes, although erroneously, called the "royal").

The diagram, Fig. 3, shows the different types of antlers, for all of which, except the last, the foregoing method of measurement must be modified.

Twisted horns such as those of the Antelopes and of various sheep should be measured along their front, back, and side curves in the manner described by Sir Victor Brooke and other authors, together with girths and distances between the various points.

The length, width, and girth of the skull at various points is desirable.

The following tables of Big Game measurements have been compiled from various works; but, as will be observed, in scarcely any case is the exact method indicated, and therefore those measurements for which the writer is not responsible must be taken on their merits. Probably no *skin*-measurements are of the slightest avail, skins being stretched out of all proportion in the process of pegging-out and drying.

In an article like the present, which is necessarily limited, it will be readily understood that not a tithe of the measurements to be found in books of sport, travel, or reference can be given, nor, indeed, can all the animals known as beasts of chase be even mentioned, this omission being particularly noticeable in the great order of the *Ungulata*, or hoofed animals. The reader is referred, therefore, to the various works by Anderson, Baillie-Grohman, Baker, Blanford, Sir Victor Brooke, Bryden, Buxton, Caton, Chapman, Gordon-Cumming, Danford and Alston, Dodge, Cornwallis, Harris, Jerdon, Littledale, Lord, Lydekker, Lord Mayo, Peek, Percy, Clive Phillipps-Wolley, Pike, Roosevelt, Sanderson, Sclater, Selous, Sterndale, Ward, Williamson, and a host of others, pre-eminent amongst which, for wealth of measurements, stands out Rowland Ward's *Records of Big Game*, 1907, which contains nearly all measurements, weights, &c., prior to that date.

CARNIVORA.

Taking the mammals from highest to lowest form, the Lion heads the list, and although sportsmen imagine specific differences to exist between the African and Asiatic Lion, and between those of various parts of Africa, nevertheless, maned or unmaned, small or large, dark, ruddy, or pale, these are but slight or local varieties, and there is really only one species.

Lion (*Felis leo*).—Sir Samuel Baker ap-

LION. [*Photo. by W. S. Berridge, F.Z.S.*

peared to consider that Lions of 500 to 600 lbs. were by no means uncommon, but the heaviest as yet recorded is one mentioned by Mr. Lydekker in the *Royal Natural History* as having been shot in the Orange Free State in 1865, which is stated to have weighed 583 lbs. The next in weight is one recorded in *The Field* of July 13, 1890, weighing 563 lbs. A fine, black-maned menagerie Lion, of abnormal size, is stated to have weighed 434 lbs., its length from nose to root of tail being 6 ft. 10 in., tail 3 ft. 2 in., girth behind shoulder 4 ft. 9 in., girth of upper arm 1 ft. 10 in., and height at shoulder 3 ft. 6 in. Selous mentions three, of the respective weights of 410 lbs., 385 lbs., and 376 lbs.; the extreme length of the largest was 9 ft. 11 in., and standing height to top of shoulder-blade 3 ft. 8 in. Mr. Roosevelt shot last year (1909), in East Africa, a big old male lion, still in its prime, which measured 9 ft. 4 in., and weighed 410 lbs. Indian Lions are generally smaller, but Sterndale gives two of the total lengths of 9 ft. 6 in. and 8 ft. 6 in. respectively, the tails of which measured

TIGER. [*Photo. by W. S. Berridge, F.Z.S.*

[*Photo. by W. S. Berridge, F.Z.S.*
LEOPARD.

3 ft. and 2 ft. 6 in., and their height at shoulder 3 ft. 6 in.

Tiger (*Felis tigris*).—In the very valuable tables given in *Big Game Shooting* and by Mr. Rowland Ward, the greatest length is 12 ft. 2 in., but this was probably that of a skin, as the largest Tiger as yet recorded only attained the length of 10 ft. 7 in. before skinning. This beast, which weighed 491 lbs., was shot by Col. Evans Gordon at Ramshai Hab, Duars, Bengal. Another tiger, shot on the Assam frontier by the late Baron de Nolde, measured 10 ft. 6 in. before skinning. The largest tiger bagged in the Maharajah of Cooch Behar's preserves, during thirty-seven years' sport, measured 10 ft. 5 in. before skinning, and weighed 504 lbs. But another specimen, shot in Cooch Behar, which measured 10 ft. 1½ in., weighed no less than 600 lbs. The weight of a tiger shot in the Central Provinces by Capt. M. D. Goring-Jones is given in *Records of Big Game* (Rowland Ward) as 700 lbs. This animal measured no more than 9 ft. 11½ in. Other tigers shot by the Maharajah of Cooch Behar or his friends weighed respectively, before skinning, 546 lbs., 532 lbs., 507 lbs., 504 lbs., 500 lbs., 496 lbs. (two), and 493 lbs. Three of these, however, are described as "fully gorged." Probably the average weight of a large Tiger may be taken as between 400 and 450 lbs., and its length as between 9 ft. 6 in. and 10 ft., including the tail of about 3 ft. The height at shoulder would be from 3 ft. 6 in. to 3 ft. 8 in. Sanderson, however, in his *Among the Wild Beasts of India,* mentions that a very bulky, old, well-fed, powerful Tiger was but 9 ft. in length, and weighed only 349½ lbs. The Tigress, as the Lioness, is of less length and of considerably less weight. The heaviest tigress ever seen by the Maharajah of Cooch Behar weighed 360 lbs. and measured 9 ft. 3 in. in length. Tiger cubs of one year old are from 4 ft. 6 in. to 5 ft. 6 in. in length, but at the age of three years attain a length of from 7 ft. to 8 ft. 6 in.

[*Photo. by W. S. Berridge, F.Z.S.*
JAGUAR.

[*Photo. by W. S. Berridge, F.Z.S.*
PUMA.

Leopard (or **Panther**) (*Felis pardus*).—As with the Lion, sportsmen attempt to differentiate between the Leopard and the Panther, and, indeed, contend for specific differences. The Leopard or Panther of Africa and India are, however, not specifically distinct, although they vary greatly both in size and colour, even to melanism, and, more rarely, albinism. The Maharajah of Cooch Behar's finest leopard measured 8 ft. 4 in., while four others shot in his domains measured 8 ft. 2¼ in., 8 ft. 1½ in. (two), and 8 ft. The heaviest weights given by the Maharajah in his book *Shooting in Cooch Behar* are 150 lbs., 140 lbs., and 139 lbs. The record leopard for length before skinning appears to be one shot by Capt. A. G. Arbuthnot in Kashmir, which attained 8 ft. 6 in. Of a leopard mentioned in *Cassell's Natural History* as

[*Photo. by W. S. Berridge, F.Z.S.*
NORTHERN LYNX.

7 ft. 6 in. in length, the height at shoulder is given as 2 ft. 7 in. Another, recorded by the Maharajah of Cooch Behar, which measured 7 ft. 10½ in. in length, was 2 ft. 2½ in. in height. Probably an average Indian leopard would measure in length from 6 ft. 6 in. to 7 ft. The two largest recorded African leopards measured 7 ft. 10½ in. and 7 ft. 9 in. respectively. Of these the former stood at shoulder 2 ft. 7½ in.; the latter, a female, 2 ft. 3½ in. The heaviest African leopard, recorded by Mr. A. White from Nyasaland, scaled 140 lbs. This animal measured 6 ft. 10 in. in length.

Photo. by W. P. Dando, F.Z.S.
LYNX.

[Photo. by W. S. Berridge, F.Z.S.
STRIPED HYÆNA.

Jaguar (*Felis onca*).—This South American cat, locally known as the "Tiger," equals and even exceeds the leopard in size. In *Records of Big Game* a specimen shot by Count H. Coudenhove is given as measuring, before skinning, 9 ft. 3 in., and another as 8 ft. 3¾ in. These were from Brazil.

Snow-Leopard (or **Ounce**) (*Felis uncia*).—This, the great prize of the Indian sportsman, is given as ranging from 7 ft. 4 in. to 6 ft. in length, from which an average length of 3 ft. must be deducted for the tail. The height at shoulder is from 2 ft. to 2 ft. 4 in.

[Photo. by W. S. Berridge, F.Z.S.
BROWN HYÆNA.

Puma (or **Cougar**) (*Felis concolor*).—Another South American cat—locally called the "Lion"—is stated in *Big Game Shooting*, vol. i., to have attained a length of 8 ft. 2 in., including the tail, of about 3 ft. Weight about 150 lbs. Average specimens appear to measure from 7 ft. to 7 ft. 5 in.

Canada Lynx (*Felis canadensis*).—Mivart gives this as not exceeding 2 ft. 6 in. in length from snout to root of tail, which is 5 in., but one from Wyoming, measured by Major G. Dalrymple White, was 38 in. in length, and weighed about 60 lbs.

Caracal or **African Lynx** (*Felis caracal*).—A mounted specimen in the Cape Town Museum measures as follows: Head and body, 2 ft. 11 in.; tail, 11·50 in. A big specimen measured in the flesh by the late

[Photo. by W. S. Berridge, F.Z.S.
SPOTTED HYÆNA.

Mr. Cloete, of Bowden, Cape Colony, was 4 ft. 3 in. in length from nose to tip of tail.

Lynx (*Felis lynx*).—Apparently the European and Asiatic Lynx, although so variable in size and coloration, are to be considered as of one species only. Blanford gives the body length as 2 ft. 9 in., and tail 7¾ in. A Spanish lynx, measured in Andalusia, by Mr. Abel Chapman, was 4 ft. 1¼ in. in length. Another, shot in the Carpathians by Prince Henry of Liechtenstein, measured 42·9 inches.

[*Photo. by W. S. Berridge, F.Z.S.*

SIBERIAN WOLF.

Striped Hyaena (*Hyaena striata*).—Sterndale gives the measurements of one as—Length of head and body 3 ft. 6 in., tail about 1 ft. 6 in.

Clouded Leopard (*Felis nebulosa*).—This Asiatic cat is stated by Jerdon to grow to a large size, and Mr. Lydekker records one of 6 ft. 6 in. Sterndale gives another whose length was 6 ft. 4 in., including the tail of 3 ft. Mr. Lydekker gives another—a male—which measured 5 ft. 7½ in., including the tail of 2 ft. 6 in.

[*Photo. by W. S. Berridge, F.Z.S.*

POLAR BEARS.

There are many smaller cats known to science which cannot be included here.

Brown Hyaena (*Hyaena brunnea*).—A mounted female in the Cape Town Museum measures: Head and body, 3 ft. 10 in.; tail, 12 in.

Hunting Leopard (or **Cheetah**) (*Cynœlurus jubatus*).—Jerdon states that an Indian adult specimen attains a length of 7 ft., of which the tail comprises 2 ft. 6 in. The height at shoulder is given as from 2 ft. 6 in. to 2 ft. 9 in. An East African cheetah, measured by Capt. R. Meinertzhagen, was 7 ft. 9 in. in length; and another, from North-West Rhodesia, measured by Mr. C. H. S. Bellis, 7 ft. 3¼ in. This last weighed 136½ lbs. Another, from the Eastern Transvaal, measured by Mr. F. Vaughan Kirby, was 6 ft. 8 in., with a tail measurement of 2 ft. 9 in.

[*Photo. by W. S. Berridge, F.Z.S.*

AMERICAN BLACK BEAR.

Spotted Hyaena (*Hyaena crocuta*).—A mounted specimen in the same museum (Cape Town) measures: Head and body, 4 ft. 6 in; tail, 14 in. One, measured by Mr. F. Vaughan Kirby in the flesh, was 4 ft. 9½ in. from nose to root of tail; tail, 1 ft. 1 in.; height at shoulder, 3 ft. The weight of an East African hyaena of this species, given by Capt. Meinertzhagen, was 121 lbs.

Wolf (*Canis lupus*).—Whether or no the Indian Wolf (*Canis pallipes*) is to be con-

[*Photo. by W. S. Berridge, F.Z.S.*

ISABELLINE BEAR.

sidered as specifically distinct from *C. lupus*, it is certain that both the European and American Wolf are to be regarded as one species. and this in spite of the extreme variability of their coloration. Sterndale gives the length as 5 ft. 2 in. to 5 ft. 8 in., including the tail of 1 ft. 8 in. Cassell gives height at shoulder as 2 ft. 8 in. A big American gray wolf will weigh as much as 97 lbs. (Roosevelt's *Outdoor Pastimes of an American Hunter*).

There are several of the smaller Cynoidea which need not be included here.

Polar Bear (*Ursus maritimus*).—A good Polar bear will weigh as much as 1,500 lbs. (see *Big Game Shooting*, vol. i.), and will measure in length, from snout to tail, from 8 ft. to 9 ft. 6 in. Capt. Lyon, in *Records of Big Game*, gives 8 ft. 7 in. as the length of a bear of this species shot by him, the weight being 1,600 lbs.

[*Photo. by W. S. Berridge, F.Z.S.*

SLOTH BEAR.

American Black Bear (*Ursus americanus*).—Adult male specimens occasionally weigh from 400 to 500 lbs. An average specimen, shot by Mr. Theodore Roosevelt, scaled 330 lbs. in winter, with an empty stomach. One shot by Mr. T. W. H. Clarke in Wyoming measured 7 ft. 5½ in., and another, shot by Mr. J. J. Harrison in the same country, 6 ft. 11 in.

Brown Bear (*Ursus arctus*).—Few exact measurements appear to have been recorded of large European specimens, but it is believed that they sometimes attain a length of fully 8 ft. from nose to root of tail. Capt. G. Ferrand gives the length of a Norwegian bear as 7 ft. 11 in., and its weight as about 800 lbs. In the Himalayas, the average length of the " Snow " or " Isabelline " bear (*Ursus arctus isabellinus*) is rather less than 6 ft., although examples of 7 ft. are met with, and the length of one has been recorded as 7 ft. 6 in., whose height was 3 ft. 5 in. Average height, 3 ft. The great bears of Siberia and Kamchatka (*U. arctus collaris,* or *piscator*) attain measurements exceeding 8 ft. The Kodiak Island bear, Alaska (*U. arctus middendorfi*), is one of the giants of the race, and the carcase of a good specimen will weigh as much as 1,500 lbs., and measure more than 8 ft. 6 in. The Alaskan bear (*U. arctus dalli*) also attains huge proportions. One shot by Capt. C. E. Radclyffe measured 7 ft. 9½ in., and weighed 1,162 lbs.

[*Photo. by W. S. Berridge, F.Z.S.*

HIMALAYAN BLACK BEAR.

Sloth Bear (*Melursus labiatus*).—Length of head and body varies from 4 ft. 6 in. to 5 ft. 8 in.; tail, exclusive of hair, 4 in. to 5 in.; height at shoulder, 2 ft. 2 in. to 2 ft. 9 in. One shot in Cooch Behar in 1903 measured 7 ft. 1 in.; and another, shot by the Maharajah of Cooch Behar in 1890,

[*Photo. by H. T. Shepstone.*

GRIZZLY BEAR.

6 ft. 10 in. The latter weighed 423 lbs. Another, shot in Cooch Behar, weighed 392 lbs., and yet another 378 lbs. Average weight of large males probably 280 lbs.

[*Photo. by W. P. Dando, F.Z.S.*

SOUTHERN SEA-LION.

Malayan Bear (*Ursus malayanus*).—Average length of head and body, 4 ft.; seldom exceeds 4 ft. 6 in. Length of adult female recorded as 3 ft. 6 in. Weight from 60 lbs. to 130 lbs.

Himalayan Black Bear (*Ursus torquatus*).—The average length from nose to root of tail is given as 4 ft. 9 in. to 5 ft. 6 in., although one is recorded, on the authority of Major Ward, as measuring 6 ft. 4 in.; and another, shot in Kashmir by Col. L. L. Fenton, 6 ft. 7 in. Average weight from 200 lbs. to 250 lbs.

Grizzly Bear (*Ursus arctus horribilis*).—A grizzly, shot in Wyoming by Mr. T. P. Kempson, measured 8 ft. 7 in.; one shot by Mr. T. W. H. Clarke, 8 ft. 0½ in.; and another, shot in British Columbia by Sir Peter Walker, Bart., 8 ft. In the wild state a heavy old grizzly bear probably exceeds 1,000 lbs. A large one in the National Zoological Park at Washington weighed 950 lbs.

Southern Sea-Lion (*Otaria jubata*).—Sometimes called Captain Cook's Sea-Lion, and stated by him to have attained, in his day, a length of 12 ft. or 14 ft., and a girth of from 8 ft. to 10 ft., but males are now said to attain a length of only 7 ft. from tip of muzzle to root of tail.

Northern Sea-Lion (*Otaria stellari*).—Adult males vary in length from 11 ft. to 13 ft., including the tail of 3 in. to 4 in., girth from 8 ft. to 10 ft.; estimated weight, 1,000 to 1,300 lbs.

Northern Sea-Bear (or **Fur-Seal**) (*Otaria ursina*).—The extreme length of adult males is given as 7 ft. to 8 ft.; girth, 6 ft. to 7 ft.; estimated weight, 700 to 800 lbs. Females: Length, 4 ft.; girth, 2 ft. 6 in.; weight, 80 to 100 lbs.

South American Fur-Seal (*Otaria australis*).—The average length of male specimens is said to be 6 ft. to 7 ft., that of females 5 ft.

Walrus (*Odobaenus rosmarus* and *O. obesus*).—Adult males appear to range in length from 9 ft. 6 in. to upwards of 12 ft. from snout to root of tail—but Elliot mentions one from the Behring Sea whose length was 13 ft. and girth 14 ft.—whilst their weight is variously estimated at from 2,250 to 3,000 lbs. and even more. Tusks have been recorded of a total length of 3 ft. and 2 ft. 9½ in., and a weight exceeding 8 lbs. each; such examples are, however, exceptional, tusks of 4 lbs. weight and 2 ft. in extreme length being considered very fine. A tusk in the Norwich Museum weighs 9 lbs. 9 oz. Tusks of females rarely exceed 1 ft. 8 in.

[*Photo. by W. S. Berridge, F.Z.S.*

CHILLINGHAM BULL.

There are many others of this group—the Carnivora pinnipedia—of which mention is here unnecessary.

UNGULATA.

Aurochs (*Bos taurus*).—No small confusion appears to exist in the nomenclature of European wild oxen. The Aurochs, which, in a sub-fossil condition, is known to palæontology as *Bos taurus* var. *primigenus*, is now only represented by the half-wild Chillingham and other park cattle, and by our domestic breeds descended therefrom. That which sportsmen term the "Aurochs" is really the European Bison (*Bos bonasus*).

The horn measurements of a Chillingham Bull in the British Museum are—Length 1 ft. 6½ in.; girth 10⅜ in.; span at tips 1 ft. 8 in.; width inside 1 ft. 9⅛ in. The horns of a bull from Chartley Park, in the possession of the Hon. Walter Rothschild, measures—Length, 1 ft. 6½ in.; girth, 7 in.; tip to tip, 34¾ in.

Gaur (*Bos gaurus*).—Known to Indian sportsmen by the incorrect designation of "Bison," this is stated to attain a height of 6 ft. 0 in. (18 hands) at the withers,

[*Photo. by W. S. Berridge, F.Z.S.*
BULL GAYAL.

and one is recorded by Sir Walter Elliot as measuring 6 ft. 1½ in. at shoulder, 5 ft. 3 in. at rump, 9 ft. 6½ in. in length from nose to root of tail, tail 2 ft. 10½ in., length of dorsal ridge 3 ft. 4 in., height of dorsal ridge 4½ in., muzzle to frontal ridge 2 ft. 1¾ in., breadth of forehead 1 ft. 3½ in., ear 10½ in., spread at tip of horns 2 ft. 1 in., girth of horns 1 ft. 7½ in. The longest horns recorded are 3 ft. 10 in., with a circumference of 1 ft. 8½ in. The greatest spread at tips recorded is 3 ft. 4 in. The record horns of a cow gaur measure 2 ft. 3 in.

[*Photo. by W. S. Berridge, F.Z.S.*
BANTING OR JAVAN OX.

Gayal (*Bos frontalis*).—Found genuinely wild in some parts of India, and smaller than its ally, the Gaur. Ward mentions two pairs of horns measuring respectively 1 ft. 3 in. and 1 ft. 0⅝ in. in length, 11½ in. and 1 ft. 1¼ in. in circumference, and 2 ft. 2⅜ in. and 2 ft. 3¾ in. from tip to tip; but Blanford records that the horns of an old wild bull measured 1 ft. 2 in. both in girth and length. The horns of a bull shot in Tenasserim by Mr. A. O. Hume measure 1 ft. 4½ in., and from tip to tip, 2 ft. 4 in.

Banting, Tsine, or **Javan Ox** (*Bos sondaicus*). — Sometimes known as the Burmese Wild Ox. The maximum height recorded of an adult bull is 5 ft. 9½ in., at withers, whilst the longest pair of horns measure 2 ft. 9½ in., with a girth of 1 ft. 5 in., and spread at tips 2 ft. 2⅞ in.

Yak (*Bos grunniens*).—The adult bull is said to weigh about 1,200 lbs., and to average from 5 ft. to 5 ft. 6 in. in height, but one is stated to be in the Leeds Museum measuring 6 ft. 0 in. in height at shoulder; 10 ft. 10½ in. in length of head and body; tail, 3 ft. 1 in.; girth at shoulder, 10 ft. 1 in.; girth at belly, 9 ft. 4 in.; at thinnest part of neck, 4 ft. 2 in.; length of horns, 3 ft. 0 in.; basal girth, 1 ft. 6 in. This length of horns has, however, been exceeded, one pair in the Lucknow Museum measuring 3 ft. 3 in. in length over the external curve, and two others being recorded (*Records of Big Game*) as exceeding 3 ft. 2 in.

EUROPEAN BISON.

European Bison (*Bos bonasus*).—Although truly wild in the Caucasus, and known as the Caucasian Bison, and semi-feral in Lithuania, where it is known as the Lithuanian Bison, there is really no specific distinction.

Of a Caucasian bull the following measurements are given:—From nose to root of tail, 10 ft. 1 in.; top of hoof to top of withers, 5 ft. 11 in.; circumference of leg below knee, 10 in.; knee, 1 ft. 4 in.; below hock, 10½ in.; round hock, 1 ft. 7 in.; girth of body, about 8 ft. 4 in. The horns of a Lithuanian bull presented to the British Museum by the Czar of Russia measure 18¼ in. in length, 12⅛ in. in girth, and from tip to tip, 13¾ in. Another head, shot in the Caucasus by Mr. St. George Littledale, measures 18 in., with a girth of 12⅛ in. and from tip to tip 16 in. The Archduke Frederick of Austria shot a bison in Hungary in 1907 which scaled 1,736 lbs.

American Bison (*Bos americanus*).—Called "Buffalo" by one of those errors which seem to dog the footsteps of sportsmen in dealing with wild oxen, this is stated to have attained, in the bull, a length of 8 ft. 6 in. from tip of muzzle to root of tail and a height of 5 ft. 9 in. at withers. The weight of an adult bull has been recorded as 1,727 lbs., which is probably not exceptional, as another, weighed by Mr. W. T. Hornaday, reached 2,100 lbs. Good-sized horns measure 1 ft. 4 in. to 1 ft. 6 in. in length, but the record pair attain 1 ft. 9½ in., and two others exceed 1 ft. 8 in.

Cape Buffalo and varieties (*Bos caffer*).—The following weights and measurements of different animals have been given by various authorities:—Length of body, 9 ft. 0 in.; tail, 3 ft. 0 in. Height at shoulder, 4 ft. 7 in. to 5 ft. Weight, 45 stone and upwards. Horns:—Extreme span at greatest width, 4 ft. 5 in.; inside span, 4 ft. 1 in.; tip to tip, 3 ft. 11½ in.; width on forehead, 1 ft. 4½ in. This grand specimen was shot by Mr. F. A. Knowles in Uganda in 1905. Another specimen from the Limpopo River measured: Extreme span, 4 ft. 1 in.; inside span, 3 ft. 8½ in.; tip to tip, 3 ft. 4½ in.; width on forehead, 11¼ in. The record Abyssinian buffalo head (*Bos caffer æquinoctialis*) measures outside, 3 ft. 8 in; inside, 3 ft. 6½ in.; tip to tip, 3 ft. 7 in.; width on forehead, 8½ in. The Congo dwarf buffalo (*Bos caffer nanus*), found on the west coast, carries much smaller horns, the record measurements hitherto being: Length on outside curve, 23½ in.; girth, 20 in.; tip to tip, 16¼ in. This is a much smaller species than the typical Cape buffalo, a fair specimen standing about 3 ft. 6 in. at the shoulder. The Lake Tchad buffalo (*B. caffer brachyceros*) is another variety of which the best measurements hitherto are: Length on outside curve, 19 in.; girth, 10 in. And of the Senegambian buffalo (*B. c. planiceros*) the best head measures: Length on outside curve, 18½ in.; girth, 12 in.; tip to tip, 6¾ in.

Indian Buffalo (*Bos bubalis*).—The bull of this species, known as the "Arna," is said to have attained, in one instance, a length of 10 ft. 6 in. from nose to root of tail. In height it reaches 6 ft. or a trifle over at the withers, and a girth of 10 ft. 8 in. A bull, shot by the Maharajah of Cooch Behar, measured 14 ft. 2 in. from nose to tip of tail, and to the base of tail 11 ft. The longest horn recorded—one in the British Museum—is accredited by one authority with a "length of 6 ft. 6½ in., which indicates a span of about 14 ft. from tip to tip in the pair"; the circumference in base of this horn—a single one—is 17⅞ in. Fair average horns measure 50 in.

Anoa (*Bos depressicornis*).—This small species of wild ox, found on the island of Celebes, stands at the shoulder about 3 ft. 3 in. The record horns measure 15⅜ in.

[*Photo. by W. P. Dando, F.Z.S.*

ARGALI SHEEP.

Musk Ox (*Ovibos moschatus*).—The horns are said to average about 2 ft. or 2 ft. 1 in. in length, but examples have been recorded ranging up to 2 ft. 6¼ in., one pair of this length having breadth of palm 1 ft. 1¾ in., and spread at tips 2 ft. 6¼ in.

American Wild Sheep (*Ovis canadensis*).—Known as the "Bighorn." Average weight of rams, 350 lbs. or less; of ewes, about 233 lbs. Of an adult ram these dimensions have been recorded:—From base of neck to root of tail, 3 ft. 6 in.; girth under forelegs, 3 ft. 9 in.; height at shoulder, 3 ft. 2 in. Approximate height of ewes, 3 ft. Horns range in length over the frontal curve from 2 ft. 8 in. to 4 ft. 2½ in. This last, the record head, has a circumference at base of 18½ in.

Siberian and Tibetan Argalis (*Ovis ammon* and *O. hodgsoni*).—These animals, whose differences may be rather of variety than of species, are among the largest of wild sheep. A good specimen of *O. ammon* stands from 3 ft. 8 in. to 4 ft. at the shoulder, and will weigh between 300 lbs. and 350 lbs. The record horns measure 62 in., with a circumference at base of

19 in. The approximate height of the Tibetan ram is given as from 3 ft. 6 in. to 4 ft. at shoulder, and the weight from 210 lbs. to 230 lbs. The record horns of this sheep measure 57 in., with a basal circumference of 18¾ in Good heads attain from 42 in. to 47 in. Of ewes' horns, the maximum record is a length of 2 ft. 2 in., with a girth of 7¼ in. These measurements are from a head (*Ovis ammon*) in the Berlin Museum.

Pamir Wild Sheep (*Ovis poli*).—Known also as Marco Polo's Sheep. The weight of an adult ram has been estimated at about 310 lbs. The height of one has been given as 3 ft. 10 in., and Mr. Blanford measured another whose length, from horns to root of tail, is given as 4 ft. 8½ in., tail 5½ in., height at withers 3 ft. 8 in., horns 4 ft. Of horns the maximum length recorded is 6 ft. 3 in., with girth 1 ft. 4 in., and spread at tips 4 ft. 6½ in.; and the greatest girth is 1 ft. 5⅜ in., with length 4 ft. 11½ in., and spread 3 ft. 9⅜ in.; horns, however, with a length of 4 ft. 5 in. to 5 ft. are considered good specimens. Horns of ewes are small, the record being no more than 14·7 in.

[*Photo. by W. S. Berridge, F.Z.S.*

OORIAL OR SHA.

Littledale's Sheep (*Ovis littledalei*).—This sheep is found in the Thian Shan, Altai, and other Central Asian ranges. The record head, obtained by Mr. Littledale in the Altai, measures in length 62¼ in., with a girth of 19¾ in. Fair heads range from 40 in. to 50 in.

Oorial, Sha, or Shapo (*Ovis vignei*).—The typical form, found in the Punjab and known as the Oorial, has an average height of about 2 ft. 8 in. at shoulder, whilst a variety, found in Ladak and called the Sha, is said to attain a greater height. Weight about 120 lbs. Maximum horn measurements: From a Punjab specimen, 39½ in., with a girth of 10¾ in., and width from tip to tip of 18¼ in.; from a Kopet Dagh Oorial (Russian Turkestan), length, 39½ in.; girth, 12¼ in.; tip to tip, 14¼ in. Horns of ewes are short and nearly straight.

[*Photo. by W. S. Berridge, F.Z.S.*

MOUFLON.

Mouflon (*Ovis musimon*).—The dimensions of a living male, formerly in the Zoological Gardens of London, were recorded as 3 ft. 3 in. from nose to tail; tail, 5 in.; from nose to base of horn, 7 in.; ears, 4 in.; neck, from posterior base of horn to abrupt angle of insertion, 8 in.; thence to base of tail, 1 ft. 9 in.; height at shoulder, 2 ft. 3 in. Maximum horn measurement, 3 ft. 6½ in.; girth, 8 in.; tip to tip, 11½ in. Good heads run from 2 ft. 2 in. to 2 ft. 8 in. Widest measurement from tip to tip, 18½ in.

[*Photo. by W. S. Berridge, F.Z.S.*

BARBARY SHEEP.

Barbary Sheep, Udad, or Arui (*Ovis lervia*).—Height 3 ft. or rather more.

Horns measure in good specimens about 2 ft. Record measurements are: Ram, in length, 33¼ in.; girth, 13¼ in.; tip to tip, 12¾ in. Ewe, length, 20¼ in.; girth, 10 in.; tip to tip, 16 in.

Kamchatkan Wild Sheep (*Ovis nivicola*).—Closely allied to, and possibly not specifically distinct from the American Wild Sheep, this sheep is said to attain an average height of about 3 ft. 2 in. at shoulder, the maximum height recorded being 3 ft. 5 in., combined with a length, from nose to tip of tail, of 5 ft. 5 in. The maximum length is 5 ft. 7 in., and the only record to hand of girth of chest is 4 ft. 6 in., with height 3 ft. 4 in. and length 5 ft. 6 in. Of another specimen, standing only 3 ft. 1 in. at shoulder, these additional measurements were made—Skull, from between horns to end of præmaxillæ, 10 in.; greatest width across orbits, 6¾ in. Horns, length round curve, 2 ft. 9 in.; circumference 1 ft. 0¾ in. Maximum length of horns recorded, 3 ft. 3¼ in., with basal girth 1 ft. 2½ in., and spread at tips 2 ft. 4¼ in. Maximum girth, 1 ft. 2½ in. Maximum spread at tips, 2 ft. 2½ in. The best recorded horns of a female measure 10¾ in. The weight of this sheep is about 250 lbs.

Pallas's Tur.

Pallas's Tur (*Capra cylindricornis*).—This wild Goat of the Eastern Caucasus, known also as the Caucasian Bharal, is said to stand about 3 ft. in height at shoulder. Horns measuring 2 ft. 7 in. along curve are considered good, although specimens have been recorded ranging in length up to 3 ft. 8¾ in. with girth 1 ft. 1½ in. Greatest span at tips 2 ft. 4 in., with length 2 ft. 7 in., and girth 11 in.

Armenian Sheep (*Ovis gmelini*).—Height at withers, usually about 2 ft. 9 in. The British Museum possesses an extremely large head, with horns measuring 3 ft. 4¼ in. along curve of fronto-nuchal edge; 10½ in. in basal circumference; and 5½ in.—the smallest record—in spread at tips. Other horns have been recorded as measuring 3 ft. 0¼ in., 2 ft. 6½ in., and 2 ft. 5¾ in. in length; 2 ft. 2 in. is, however, a very good length. Maximum circumference given, 10⅝ in. Maximum spread, 1 ft. 6 in.

[*Photo. by W. S. Berridge, F.Z.S.*

Bharal Sheep.

Bharal (*Ovis nahura*).—Approximate height of ram, 3 ft. at withers; ewe, altogether smaller. Weight about 130 lbs. Horns measuring 2 ft. along curve, and about 11 in. in girth, are considered good, but examples have been recorded ranging in length to 2 ft. 8½ in.; in girth, to 1 ft. 1½ in.; and in spread at tips to 2 ft. 10 in.

West Caucasian Tur (*Capra caucasica*).—Inhabiting the Western Caucasus, and known locally as the "Ibex," yet doubtfully of a distinct species from Pallas's Tur.

[*Photo. by W. P. Dando, F.Z.S.*

West Caucasian Tur.

Height at shoulder about 3 ft. or a little over. Horns have been recorded ranging in length to as much as 3 ft. 4⅛ in., with a girth of 12⅝ in., and width from tip to tip of 15¼ in. Good heads attain about 30 in., or a trifle over. The greatest spread—2 ft. 3⅝ in.—was found in a pair of horns 3 ft. 0⅞ in. in length.

Cyprian Sheep (*Ovis gmelini ophion*).—Of this form, which seems to be but a variety of the Armenian Sheep and not a distinct species, the ram barely exceeds 2 ft. 3 in. in height at withers, whilst, of the few horns noted, the maximum length is 2 ft. 3 in., with a girth of 7½ in. and a spread of 8¾ in. Greatest spread, 1 ft. 4½ in.

Spanish Wild Goat (*Capra pyrenaica*).—Erroneously called an "Ibex," being more nearly related to the Turs. Height at shoulder about 2 ft. 6 in. Weight (clean) about 140 lbs. Good-sized horns measure about 2 ft. in length, but specimens have been recorded ranging up to 2 ft. 7 in., this length being combined with the maximum spread of 2 ft. 2½ in., and a girth of only 8¾ in. Maximum girth recorded 10½ in., with length 2 ft. 4¾ in. and spread 2 ft. 4⅝ in.

Persian Wild Goat (*Capra hircus aegagrus*).—This species, termed the Pasang (*i.e.* rock-footed) by the Persians, is said to be the chief ancestor of the different breeds of domestic goats. The height of an adult male is given as 3 ft. 1 in. at shoulder. Of horns, a length of 3 ft. 6 in. along curve is considered good, although one pair of 4 ft. 7½ in. has been recorded. The maximum girth—10 in.—accompanied a length of 4 ft. 5 in., and a span from tip to tip of 3 ft. 10 in. The width from tip to tip varies greatly, some horns measuring no more than 5 in. or 6 in.

[*Photo. by W. S. Berridge, F.Z.S.*

PERSIAN IBEX.

Markhor (*Capra falconeri*).—Several varieties are known, but there appears to be only one species. Heights are given of 3 ft. 2½ in. and 3 ft. 2 in. at shoulder, and lengths of horns around curve are recorded as 5 ft. 3 in., 5 ft., 4 ft. 11 in., 4 ft., and under. Measured in a straight line, the greatest length appears to be 4 ft. 3½ in. Greatest circumference, 1 ft. 1⅖ in. Span at tips from about 4 ft. 4 in. downwards. Weight from 200 to 240 lbs.

[*Photo. by W. S. Berridge, F.Z.S.*

MARKHOR.

Alpine Ibex (*Capra ibex*).—The Ibex, Steinbock, or Bouquetin, has now disappeared as a truly wild animal; it is therefore a matter for concern that but few horn-measurements are to hand. One pair in the possession of the King of Italy (noted in Mr. Rowland Ward's invaluable *Records of Big Game*) measures 3 ft. 8⅝ in. over the curve, and 10¼ in. in girth. Other recorded specimens range from 2 ft. 2¾ in. to 3 ft. 3¾ in. The King of Italy's ibex, above referred to, weighed 170 lbs., and stood at the shoulder 2 ft. 9⅝ in. It was shot in the Vale of Aosta, where these animals are still preserved.

Asiatic Ibex (*Capra sibirica*).—The respective weights of a male and female are given as 188 lbs. and 104 lbs., but males sometimes attain as much as 205 lbs. The height of one male specimen was stated to be 3 ft. 4 in. at shoulder; that of a female 6 in. less. Males occasionally reach 3 ft. 8 in. at the shoulder. Good heads vary from 45 in. to 50 in. over the horn curve. The record pair measure 4 ft. 9⅜ in., with a girth of 11 in., and a tip to tip span of 30 in. This head was obtained in the Thian Shan range.

Himalayan Tahr (*Hemitragus jemlaicus*).—Males are given as weighing 200 lbs., and as standing from 3 ft. to 3 ft. 4 in., at shoulder, with a total length of 4 ft. 6 in. Greatest length of horns, 1 ft. 3½ in. Greatest circumference, 9 in.; span, 11¼ in.

[*Photo. by W. S. Berridge, F.Z.S.*

HIMALAYAN TAHR.

Himalayan Serow (*Nemorhaedus bubalinus*).—Called also Forest Goat. Height of one recorded as 3 ft. 2 in. at shoulder; weight as 190 lbs. Greatest length of horns recorded, 1 ft. 1¼ in.; girth, 6½ in.; tip to tip, 2¾ in. A specimen, 10½ in. in length, had a girth of 5⅜ in. and spread of 3½ in.; 5⅝ in. girth, and 5¼ spread are, however, recorded.

[*Photo. by W. S. Berridge, F.Z.S.*

HIMALAYAN SEROW.

Nubian Ibex (*Capra nubiana*).—This, sometimes known as the Arabian or Sinaitic Ibex, is found in three slightly varying races. The record Asiatic head from Arabia measures 4 ft. 2 in., with a girth of 9 in. The best African head from Upper Egypt reaches 4 ft. 3 in., with a girth of 8⅝ in., and width from tip to tip of 3 ft. 6½ in.

Abyssinian Ibex (*Capra vali*).—Height at shoulder about 40 in.; weight about 250 lbs. or 260 lbs. Good heads range from 40 in. to 42 in. The record, secured by Major Powell Cotton, measures 43⅝ in., with a tip to tip width of 12½ in. A female head measures 13¼ in.; girth, 4⅞ in.; tip to tip, 8⅝ in.

Arabian Tahr (*Hemitragus jayakeri*).—A small and very little-known species. Height about 24½ in. Length of horns, 11⅝ in. Obtained by Col. A. S. G. Jayaker in the Oman Mountains, South-East Arabia.

Nilgiri Tahr (*Hemitragus hylocrius*).—Called "Ibex" by Indian sportsmen. Has a height of from 3 ft. 3 in. to 3 ft. 6 in. at shoulder. Greatest length of horns recorded, 1 ft. 5½ in., with a girth of 9⅞ in. Greatest span, 7¼ in.

[*Photo by W. P. Dando, F.Z.S.*

NILGIRI TAHR.

Goral (*Urotragus goral*).—Sometimes called Himalayan Chamois. Height at shoulder, 2 ft. 2 in. to 2 ft. 4 in.; total length, 4 ft. Weight from 50 to 63 lbs. Greatest length of horns given, 9⅛ in.; girth, 3¾ in.; spread at tips, $4\frac{5}{16}$ in.

Japanese Serow (*Nemorhaedus crispus*).—A small species found with an allied race (*N. Swinhoei*) in Japan and Formosa.

Record horns, 6¾ in.; girth, 4¼ in.; tip to tip, 3⅞ in.

Rocky Mountain Goat (*Haploceros montanus*).—Weight is given as about 300 lbs. Greatest length of horns given, 11½ in.; greatest girth, 6½ in.; spread at tips, 8¾ in.

[*Photo. by W. S. Berridge, F.Z.S.*
ROCKY MOUNTAIN GOAT.

Takin (*Budorcas taxicolor*).—Height, 3 ft. 6 in. at shoulder. Of horns, the greatest length recorded is 2 ft. 1 in., with a girth of 1 ft. 1 in., and a spread at tips of 11½ in.

Chamois (*Rupicapra tragus*).—Average weight from 50 to 70 lbs. Greatest length of horns given, 12¾ in.; this head was secured in Hungary. Another Hungarian specimen had a horn measurement of 12¼ in.; girth, 4⅛ in.; spread, tip to tip, 7½ in.

[*Photo. by W. S. Berridge, F.Z.S.*
CHAMOIS.

Eland (*Taurotragus oryx*).—One of the few species of Antelopes in which the horns of the cows exceed in length, though not in thickness, those of the bulls. Selous shot one measuring 5 ft. 10 in., and another 5 ft. 9 in. in height at withers, but in early days, when these antelopes were very plentiful, bulls occasionally reached 6 ft. Two authorities, Sir John Barrow and Sir W. Cornwallis Harris, give measurements of 6 ft. 6 in. Weight often exceeding 1,000 lbs., old bulls sometimes attaining to 1,500 lbs. and over. Maximum length of horns: Of a cow, 3 ft. 5 in.; girth, 7⅞ in.; tip to tip, 13 in.; of a bull: 3 ft. 1 in., with a girth of 12¾ in., and from tip to tip 23¾ in.

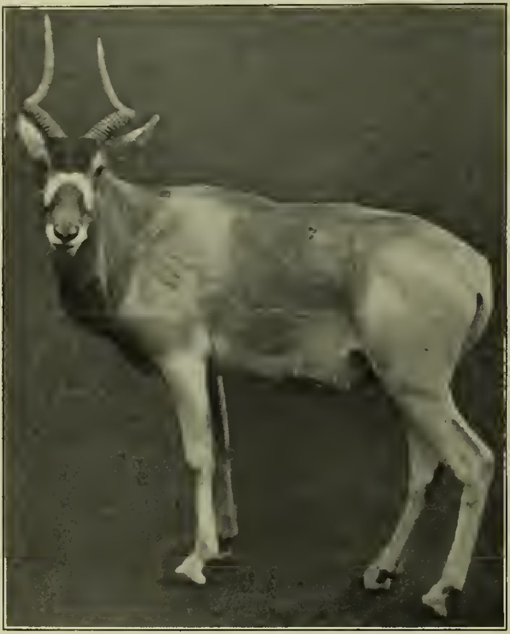
[*Photo. by W. P. Dando, F.Z.S.*
ELAND.

Derbian Eland (*Taurotragus derbianus*).—The horns of the male in this species are usually larger than in the preceding. One in the Berlin Museum measures 3 ft. 4 in., with a basal girth of 13½ in. Another from the White Nile country measures 3 ft. 3¼ in., with a girth of 13 in. Greatest basal girth is 14⅛ in.; greatest spread, tip to tip, 33½ in.

Kudu or **Koodoo** (*Strepsiceros kudu*).—Males may stand about 4 ft. 4 in., and even 5 ft., at shoulder. Weight of a good male about 500 lbs. The length of body is stated to be 9 ft. Selous shot one whose horns measured, in a straight line from base to tip, 3 ft. 9⅜ in.; around curve, 5 ft. 0⅝ in.; basal girth, 11½ in.; spread between tips, 2 ft. 9 in. Another pair taken by him had a length, from base to tip, of 3 ft. 5 in., with the maximum measurement around spiral turn of 5 ft. 4 in. A pair in the possession of Mr. F. H. Barber measure 4 ft. 0⅞ in. in a straight line.

Lesser Kudu or **Koodoo** (*Strepsiceros imberbis*).—Maximum horn measurements are: Length in straight line, 2 ft. 2¼ in.; length around curve, 2 ft. 11¾ in.; circumference, 7½ in.; spread at tips, 1 ft. 4½ in. Height at shoulder about 3 ft. 5 in. Weight about 230 lbs.

Addax (*Addax nasomaculatus*).—Height, 3 ft. 6 in. The record pair of horns, in the collection of Sir Edmund Loder, measure, over curve, 3 ft. 3$\frac{5}{16}$ in.; straight, 2 ft. 10½ in.; girth, 5⅞ in.; tip to tip, 18¾ in.

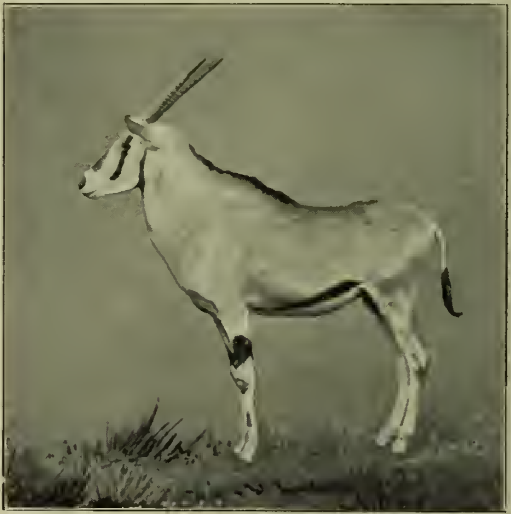


[*Photo. by W. S. Berridge, F.Z.S.*

ADDAX.

Bushbuck or **Harnessed Antelope** (*Tragelaphus scriptus*).—Under this designation are to be found several varieties formerly considered as species—the first, the typical variety of West, Central, and South Central Africa; the second from Abyssinia; the third from East Africa; the fourth from the Nile and Sudan; and the fifth, the "Bushbuck" of the Cape. Stated to stand 2 ft. 8 in. at shoulder, and to measure about 5 ft. in length. The maximum measurements recorded of different horns are: Cape bushbuck, 19¾ in.; West African, 12¼ in.; East African, 18½ in.; Nile, 14½ in.; Abyssinian, 17 in.

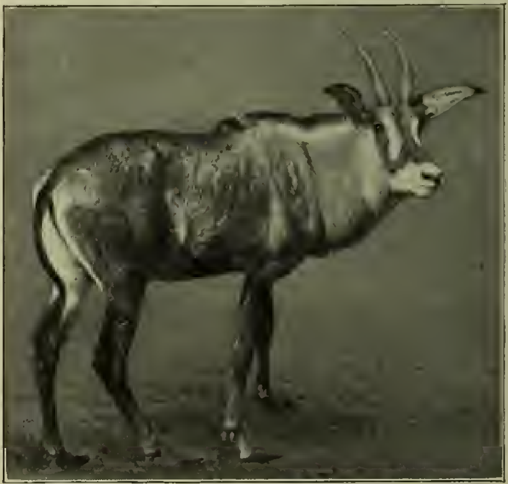
Beisa (*Oryx beisa*).—Height about 3 ft. 10 in. Weight (*Records of Big Game*), 458 lbs. Horns of the female, as in the Gemsbok, longer than those of the male. Maximum measurements of different horns are: Length, 3 ft. 4 in. and 3 ft. 3 in.; circumference, 7¼ in.; spread at tips, 12¼ in.



[*Photo. by W. P. Dando, F.Z.S.*

BEISA.

Roan Antelope (*Hippotragus equinus*).—Height at shoulder, 4 ft. 9 in. Weight (*Records of Big Game*) about 625 lbs. Maximum measurements of different horns: Length, 3 ft. 3¼ in.; girth, 10½ in.; spread at tips, 1 ft. 5¼ in.



[*Photo. by W. P. Dando, F.Z.S.*

ROAN ANTELOPE.

Western Situtunga (*Tragelaphus gratus*).—Height at shoulder, 3 ft. 6 in.; length from chest to rump, 3 ft. 6 in.; tail, 11½ in.;

ears, 5½ in. Maximum length of horns, 2 ft. 10¾ in.; girth, 8 in.; tip to tip, 21 in.

Sable Antelope (*Hippotragus niger*).—Height at shoulder, 4 ft. 6 in.; extreme length nearly 9 ft.; tail, 2 ft. 1 in.; ears, 10 in. Maximum measurements of different horns: Length, 4 ft. 2½ in.; girth, 10½ in.; spread at tips, 2 ft. 5 in.

[*Photo. by W. S. Berridge, F.Z.S.*

SABLE ANTELOPE.

Dorcas Gazelle (*Gazella dorcas*).—Height at shoulder, about 22 in. Of different horns, the maximum measurements recorded are: Length, 1 ft. 1⅜ in.; girth, 4¼ in.; spread at tips, 5¾ in.

[*Photo. by W. S. Berridge, F.Z.S.*

DORCAS GAZELLE.

Situtunga or **Nakong** (*Tragelaphus spekei*).—Height of male at shoulder, 3 ft. 7 in. Maximum horn measurements are: Length over curve, 2 ft. 11⅛ in.; girth, 8 in.; tip to tip, 15⅛ in.

Inyala (*Tragelaphus angasi*).—Height at shoulder, 3 ft. 6 in.; weight, 250 lbs. to 300 lbs. Maximum length of horns, over curve, 2 ft. 7⅜ in.; girth, 8¼ in.; tip to tip, 9½ in.

Bongo (*Boöceros euryceros*).—Height at shoulder, 4 ft. or thereabouts. Maximum horn measurements: Male, 35 in. over front curve; girth, 10 in.; tip to tip, 11 in. Female, 30½ in., 8¼ in., and 11 in.

Springbuck (*Antidorcas euchore*).—Height, 2 ft. 6 in. to 2 ft. 8 in. Weight about 70 lbs. to 80 lbs. Maximum measurements of different horns: Length on curve, 1 ft. 7 in.; girth, 6½ in.; spread at tips, 12½ in.

[*Photo. by W. P. Dando, F.Z.S.*

SPRINGBUCK.

Nilgai (*Boselaphus tragocamelus*).—Height of males, 4 ft. 4 in. to 4 ft. 8 in., or even 4 ft. 10 in., at shoulder; length, 6 ft. 6 in. to 7 ft.; tail, 1 ft. 6 in. to 1 ft. 9 in. Maximum measurements of different horns are: Length, 9⅞ in.; circumference, 8½ in.; spread at tips, 7¾ in.

Gemsbok (*Oryx gazella*).—Height about 3 ft. 10 in. Horns of the female usually longer than those of the male. Maximum records: Female, 3 ft. 11½ in.; circumference, 6¾ in.; spread at tips, 1 ft. 1½ in. Of a male, length, 3 ft. 6 in.; girth, 7¾ in.; tip to tip, 23 in.

Fringe-eared Oryx (*Oryx callotis*).—Height, 3 ft. 10 in. to 4 ft. Maximum measurements of different horns are: Length, 2 ft. 9½ in.; girth, 7 in.; spread at tips, 1 ft. 2½ in.

Leucoryx or **White Oryx** (*Oryx leucoryx*). — No body-measurements nor weights are to hand. The longest horns recorded have a length of 3 ft. 8½ in.; girth, 6⅜ in.; spread at tips, 9 in.

Beatrix or **Arabian Oryx** (*Oryx beatrix*).—Height at shoulder about 2 ft. 8 in. Record horn measurements (Paris Museum): Length, 2 ft. $2\frac{13}{16}$ in.; girth, 4¾ in.; tip to tip, 10¼ in.

Indian Gazelle or **Ravine Deer** (*Gazella bennetti*).—Height at shoulder, 2 ft. Of different horns, the maximum measurements are: Length, 1 ft. 3⅝ in.; girth, 4¾ in.; spread at tips, 8⅝ in.

[*Photo. by W. S. Berridge, F.Z.S.*

INDIAN GAZELLE.

Goa or **Tibetan Gazelle** (*Gazella picticaudata*).—Height about 2 ft. Maximum measurements, different horns: Length, 14⅛ in.; girth, 4¾ in.; tip to tip, 6¼ in.

Mongolian Gazelle (*Gazella gutturosa*).—Height about 2 ft. 6 in. Maximum measurements of a single pair of horns: Length, 15¾ in.; girth, 5 in.; tip to tip, 6·34 in.

Przewalski's Gazelle (*Gazella przewalskii*).—Height rather more than 2 ft. Record measurements of a head in the British Museum. Length of horns, 10¼ in.; girth, 4⅜ in.; tip to tip, 2¾ in.

Goitred Gazelle (*Gazella subgutturosa*).—Height about 2 ft. 2 in. The best horns hitherto recorded, in the possession of Sir Edmund Loder, measure: Length, 1 ft. 4⅝ in.; girth, 4½ in.; tip to tip, 6¾ in.

Edmi or **Atlas Gazelle** (*Gazella cuvieri*).—Height about 2 ft. 3 in. The finest recorded pair of horns measure: Length, 14⅞ in.; girth, 5 in.; tip to tip, 3⅝ in.

Palestine Gazelle (*Gazella merrilli*).—A Syrian mountain species, at present very little known. Maximum horn measurements, recorded by Mr. Douglas Carruthers: Length, 263 mm.; girth, 108 mm.; tip to tip, 117 mm.

Arabian Gazelle (*Gazella arabica*).—Height about 2 ft. or a little over. Best horns yet recorded measure: Length, 10¾ in.; girth, 4¾ in.; tip to tip, 4⅝ in.

Speke's Gazelle (*Gazella spekei*).—Height about 2 ft. The finest pair of horns at present recorded measure in length 12½ in., and from tip to tip 3½ in. A girth measurement of 4⅜ in., and from tip to tip of 5¼ in., have been recorded in other specimens.

Pelzeln's Gazelle (*Gazella pelzelni*).—Height about 24 in. to 25 in. The maximum horn measurement is $13\frac{3}{16}$ in.; another head measures: Length, 13⅛ in.; girth, 4½ in.; tip to tip, 3½ in.

Loder's Gazelle (*Gazella lepto-ceros*).—Height about 2 ft. 4 in. Maximum horn measurements: Length, 15⅞ in.; girth, 3½ in.; tip to tip, 6¼ in.

Isabella Gazelle (*Gazella isabellina*).—Height, 24 in. to 25 in. The best horns yet recorded measure: Length, 10¾ in.; girth, 3⅞ in.; tip to tip, 4⅝ in.

Heuglin's Gazelle (*Gazella tilonura*).—Height about 2 ft. 2 in to 2 ft. 3 in. Maximum horn measurement: Length, 11¾ in.; girth, 5 in.; tip to tip, 2 in. A circumference of 4½ in. has been recorded, and a tip to tip measurement of 4¼ in.

Senegal or **Red-fronted Gazelle** (*Gazella rubifrons*).—Height about 25 in. Best horn measurements yet recorded: Length, 13⅞ in.; girth, 5¼ in.; tip to tip, 7½ in.

Rothschild's Gazelle (*Gazella albonotata*).—A specimen shot by Mr. P. Niedieck on the White Nile gives the following measurements, which at present constitute the record: Length, 12⅝ in.; girth, 4⅜ in.; tip to tip, 4 in.

Thomson's Gazelle (*Gazella thomsoni*).—Height about 25 in. Maximum horn measurements: Length, 16 in.; girth, 4½ in.; tip to tip, 2 in. Some specimens give a span from tip to tip of as much as 6½ in., 7 in., and in one case 11¾ in.

Grant's Gazelle (*Gazella granti*).—Height about 34 in. Weight (*Records of*

Big Game) from 150 lbs. to 166 lbs. Maximum measurements, from a specimen secured by Capt. F. A. Dickinson: Length, 30¼ in.; girth, 7¾ in.; tip to tip, 20 in.

Peters's Gazelle (*Gazella granti petersi*).—A local race of the foregoing species. Height at shoulder from 32 in. to 33 in. Maximum horn measurements: Length 23¾ in.; girth, 6½ in.; tip to tip, 11 in.

Sœmmering's Gazelle or **Aoul** (*Gazella sœmmeringi*).—Height at shoulder about 35 in. Weight about 90 lbs. (clean). Maximum horn measurements: Length, 22½ in.; girth, 4½ in.; tip to tip, 13¾ in.

Addra or **Red-necked Gazelle** (*Gazella ruficollis*).—Height about 3 ft. Maximum horn measurements: Length, 14¾ in.; girth, 6 in.; tip to tip, 7 in.

Dama Gazelle (*Gazella dama*).—Height about 3 ft. The best horns yet recorded measure: Length, 13¾ in.; girth, 5½ in.; tip to tip, 6¾ in.

Swift Gazelle or **Mhorr** (*Gazella dama mhoor*).—A northern race of the last-named species. Height, 3 ft. and upwards. Maximum horn measurements: Length, 11¾ in.; girth, 6 in.; tip to tip, 3¾ in.

Clarke's Gazelle or **Dibatag** (*Ammodorcas clarkei*).—Height about 2 ft. 9 in. Weight from 65 lbs. to 70 lbs. The best horns yet recorded measure in length, over the curve, 13 in. A pair in the Museum of the Hon. Walter Rothschild measure: Length, 12⅝ in.; girth, 5¼ in.; tip to tip, 4⅝ in.

Waller's Gazelle or **Gerenuk** (*Lithocranius walleri*).—Height, 40 in. to 41 in. Weight about 115 lbs. The record horns in the possession of the Duc d'Orléans measure: Length, 17 in.; girth, 5¼ in.; tip to tip, 3¾ in. A horn girth of 6 in. has been recorded, and a tip to tip measurement of 6⅜ in.

Beira Antelope (*Dorcatragus melanotis*).—Height from 21 in. to 24 in. Maximum horn measurements: Length, 5 in.; girth, 1¾ in.; tip to tip, 3¼ in.

Tibetan Antelope or **Chiru** (*Pantholops hodgsoni*).—Height at shoulder, 2 ft. 7 in. Weight from 90 lbs. to 120 lbs. Of different horns, the maximum measurements are: Length, 2 ft. 3¾ in.; girth, 6⅛ in.; spread at tips, 1 ft. 5¼ in.

Black-buck or **Indian Antelope** (*Antilope cervicapra*).—The height at shoulder is given as 2 ft. 8 in., and the average weight as 85 lbs.; the size, however, varies considerably in different localities, the smallest variety being found in Mysore, where, according to Sanderson, horns average 1 ft. 2 in. in length, and rarely exceed 1 ft. 6 in., although, in other parts of India, the average length is 2 ft. 2 in. or 2 ft. 3 in. Maximum measurements of different horns: Length in straight line, 2 ft. 6½ in.; circumference, 5½ in.; spread at tips, 2 ft. 3¾ in.

[*Photo. by W. S. Berridge, F.Z.S.*

Black Buck.

Reedbuck (*Cervicapra arundineum*).—Height about 3 ft. Maximum measurements of different horns: Length, 1 ft. 6 in.; girth, 7½ in.; spread at tips, 1 ft. 8½ in.

[*Photo. by W. P. Dando, F.Z.S.*

Reedbuck.

Impala or Pallah (*Aepyceros melampus*).—Height rather under 3 ft. Maximum measurements of different horns: Length on curve, 2 ft. 7¼ in.; straight, 2 ft. 1 in.; girth, 6⅝ in.; tip to tip, 25 in.

Saiga Antelope (*Saiga tatarica*).—Height about 2 ft. 6 in. Maximum measurements of different horns: Length, 1 ft. 2⅜ in.; girth, 5¼ in.; spread at tips, 5⅞ in.

Bohor Reedbuck (*Cervicapra redunca*).—Height about 2 ft. 4 in. The best horns yet recorded measure: Length, 14½ in.; girth, 4¾ in.; tip to tip, 15 in.

Mountain Reedbuck or Rooi Rhebok (*Cervicapra fulvorufula*).—Height, 2 ft. 4 in. to 2 ft. 6 in. The best horns yet recorded measure: Length, 8⅞ in.; girth, 4⅞ in.; tip to tip, 4¾ in.

Vaal Rhebok (*Pelea capreola*).—Height about 2 ft. 6 in. The record horns measure 11½ in. in length. Another pair measure $11\frac{1}{16}$ in.; girth, 2⅛ in.; tip to tip, 6¾ in.

Waterbuck (*Cobus ellipsiprymnus*).—Height, 4 ft. to 4 ft. 4 in. Maximum measurements of different horns: Length, 3 ft. 0¼ in.; girth, 10⅛ in.; spread at tips, 2 ft. 5½ in.

Defassa Waterbuck or Sing-Sing (*Cobus defassa*).—There exist four races of this waterbuck: the West African sing-sing, the Abyssinian defassa, Crawshay's defassa, and Penrice's waterbuck. Of these the first stands from 4 ft. to 4 ft. 1 in. at the shoulder, the next from 4 ft. to 4 ft. 3 in., while Crawshay's stands from 3 ft. 10 in. to 4 ft., and Penrice's from 4 ft. to 4 ft. 2 in. Maximum measurements of different horns: Length, 2 ft. 11½ in.; girth, 10 in.; spread at tips, 2 ft. 10 in.

[*Photo. by W. S. Berridge, F.Z.S.*

SING-SING.

Mrs. Gray's Kob (*Cobus maria*).—Height about 3 ft. 2 in. The finest pair of horns yet recorded measure: Length, 2 ft. 8¼ in.; girth, 7¼ in.; tip to tip, 16¼ in.

White-eared Kob (*Cobus leucotis*).—Height, 2 ft. 10 in. to 3 ft. Maximum horn measurements, from one head: Length, 2 ft. 0¾ in.; girth, 7¼ in.; tip to tip, 11 in.

Buffon's Kob (*Cobus kob*).—Height about 2 ft. 9 in. The best horns yet recorded measure: Length, 1 ft. 8½ in.; girth, 6¾ in.; tip to tip, 10½ in.

Uganda Kob (*Cobus thomasi*).—Height from 2 ft. 10 in. to 3 ft. Record head measures: Length, 2 ft. 1 in.; girth, 7⅛ in.; tip to tip, 12 in.

Vaughan's Kob (*Cobus vaughani*).—A newly discovered species. Few measurements are yet available. A type head (British Museum) measures: Length of horns, 17⅝ in.; girth, 6 in.; tip to tip, 7¾ in.

Lechwe (*Cobus leche*).—Height about 3 ft. 4 in. to 3 ft. 5 in. The longest horns yet recorded measure 2 ft. 10½ in. Another pair measure: Length, 2 ft. 9½ in.; girth, 7 in.; tip to tip, 2 ft. 2¾in.

Puku (*Cobus puku*).—Height from 3 ft. 4 in. to 3 ft. 6 in. Record horns measure: Length, 1 ft. 8¾ in.; girth, 7⅞ in.; tip to tip, 17 in.

Klipspringer (*Oreotagus saltator*).—Height, 1 ft. 10 in. Maximum measurements of different horns: Length, 5⅜ in.; girth, 3⅛ in.; spread at tips, 3¼ in.

Steinbok (*Rhaphiceros campestris*).—Height, 1 ft. 8 in. The largest horns are recorded as 7½ in. in length, and 1¾ in. in girth, with 3½ in. spread at tips.

Sharpe's Steinbok (*Rhaphiceros sharpei*).—Record is: Length, $1\frac{11}{16}$ in.; girth, 1⅝ in.; tip to tip, 1⅜ in.

Grysbok (*Rhaphiceros melanotis*).—Height about 1 ft. 10 in. Record horns to date: Length, 4⅞ in.; girth, 1½ in.; tip to tip, 1⅞ in.

Zanzibar Suni (*Nesotragus moschatus*).—Height about 13 in. Maximum horn measurements: Length, 3⅞ in.; girth, 1⅞ in.; tip to tip, 1⅝ in.

Livingstone's Suni (*Nesotragus livingstonianus*).—Height about 15 in. Maximum horn measurements: Length, 5 in.; girth, 1⅞ in.; tip to tip, 2¼ in.

Cape Oribi (*Oribia scoparia*).—Height about 2 ft. Record horns measure: Length, 7½ in.; girth, 2¾ in.; tip to tip, 2⅝ in.

Abyssinian Oribi (*Oribia montana*).—Height about 1 ft. 10 in. Best recorded horns measure: Length, 5⅜ in.; girth, 2 in.; tip to tip, 2⅝ in.

West African Oribi (*Oribia nigricaudata*).—Height about 1 ft. 8 in. Maximum horn measurements: Length, 4¾ in.; girth, 2½ in.; tip to tip, 2¼ in.

Haggard's Oribi (*Oribia haggardi*).—Height about 2 ft. Record horns measure: Length, 6⅜ in.; girth, 2⅛ in.; tip to tip, 3 in.

Dik-Dik.—Some seven species of these tiny antelopes are at present known to zoologists. These are Salt's, Swayne's, Phillips', Günther's, Kirk's, Hemprich's, and the Damara Dik-Diks. They range in height from 14 in. to a little over 15 in., and weigh from 7 lbs. to 9 lbs. The short horns average in the various species from 2 in. to 3 in. in length. The best measurements yet recorded are in Günther's Dik-Dik (*Madoqua guentheri*): Length, 3⅝ in.; girth, 1⅝ in.; tip to tip, 2 in. The best head of Kirk's Dik-Dik (*M. kirki*) gives very similar measurements: Length, 3⅝ in.; girth, 1⅝ in.; tip to tip, 1⅛ in.

Cape Duiker (*Cephalophus grimmi*).—Although it is supposed that only the males are horned, yet Mr. Selous has met with three examples of horned females. Height about 1 ft. 10 in. Maximum measurements of different horns: Length, 6½ in.; girth, 2⅝ in.; spread at tips, 3¼ in.

Abyssinian Duiker (*C. abyssinicus*).—Record horns measure: Length, 4¼ in.; girth, 2¼ in.; tip to tip, 3 in.

Blue Duiker or Bluebuck (*C. monticola*).—Height about 13 in. Record horns: Length, 2½ in.; girth, 1¾ in.; span, 1½ in.

Red or Natal Duiker (*C. natalensis*).—Height about 17 in. Record horns: Length, 3⅞ in.; girth, 2¾ in.; span, 2 in.

Bay Duiker (*C. dorsalis*).—Record horns measure 3$\frac{11}{16}$ in.

Banded Duiker or Mountain Deer (*C. doriæ*).—Horns measure from 1⅝ in. to 1⅞ in. in length.

Yellow-backed Duiker (*C. sylvicultor*).—A large duiker of the West Coast of Africa. Height, 2 ft. 10 in. Record horns: Length, 7 in.; girth, 3½ in. Best tip to tip measurement, 4½ in.

Harvey's Duiker (*C. harveyi*).—Height about 17 in. Maximum horn measurements from one head: Length, 3⅝ in.; girth, 3¼ in.

Red-flanked Duiker (*C. rufilatus*).—Height about 14 in. Maximum horn measurements: Length, 3$\frac{7}{16}$ in.; girth, 2⅞ in.; span, 2⅝ in.

Crowned Duiker (*C. coronatus*).—Height, 15 in. to 16 in. Best horn measurements, from one head: Length, 4½ in.; girth, 2¼ in.; span, 2⅞ in.

White-tailed Gnu or Black Wildebeest (*Connochætes gnu*).—Height, 3 ft. 6 in. to 3 ft. 10 in. at shoulder. Maximum measurements of different horns: Length, 2 ft. 6⅞ in.; girth, 1 ft. 10½ in.; breadth of palm, 11½ in.; spread at tips, 1 ft. 9¼ in.

[*Photo. by W. S. Berridge, F.Z.S.*

WHITE-TAILED GNU.

Blue Wildebeest or Brindled Gnu (*Connochætes taurina*).—Height at shoulder about 4 ft. 2 in. to 4 ft. 5 in. Mr. F. J. Jackson has recorded a weight of 475 lbs. in the case of an old bull in good condition. Maximum measurements of different horns: Length, 2 ft. 7 in.; breadth of palm, 6½ in.; girth, 1 ft. 1¼ in.; spread at tips, 2 ft. 2½ in.; width inside, 2 ft. 5 in.

[*Photo. by W. S. Berridge, F.Z.S.*

BRINDLED GNU.

Four-horned Antelope or **Chousingha (Charsingha)** (*Tetraceros quadricornis*).—Height of male, about 2 ft. 2 in. at shoulder, and slightly higher at croup. The remarkable horns, which are only found in the male, have greater length in the posterior than in the anterior pairs. Maximum measurements of different horns are: Of the posterior pair, length, 5 in.; girth, 2¼ in.; spread at tips, 3 in. Of the anterior pair, 2½ in., 2⅜ in., and 2⅞ in. respectively.

Hartebeest (*Bubalis caama*).—Height, 4 ft. Maximum measurements of different horns: Length, 2 ft. 2 in.; girth, 12 in.; spread at tips, 16½ in.

[*Photo, by W. P. Dando. F.Z.S.*

HARTEBEEST.

Lichtenstein's Hartebeest (*Bubalis lichtensteini*).—Height, 4 ft. 2 in. to 4 ft. 4 in. Weight about 300 lbs. The best pair of horns yet recorded measure: Length over curve, 1 ft. 10⅞ in.; girth, 11 in.; tip to tip, 7⅞ in. A spread of 15 in. from tip to tip has been recorded, and a girth of 13¼ in.

Heuglin's and Jackson's Hartebeests (*Bubalis lelwel* and *Bubalis lelwel jacksoni*).—Height about 4 ft. 4 in. Weight about 405 lbs. The record horns measure: Length, 2 ft. 1 in.; girth, 12¼ in.; tip to tip, 11½ in.

Niedieck's Hartebeest (*Bubalis niediecki neum*).—The best horns yet recorded measure: Length, 1 ft. 10 in.; girth, 10¼ in.; tip to tip, 12¼ in.

Blesbok (*Damaliscus albifrons*).—Height about 3 ft. 4 in. to 3 ft. 6 in. Weight, 180 lbs. to 190 lbs. Maximum measurements of different horns: Length, 1 ft. 6¼ in.; girth, 7¼ in.; spread at tips, 1 ft. 0¼ in.

[*Photo. by W. S. Berridge, F.Z.S.*

BLESBOK.

Neumann's Hartebeest (*Bubalis neumanni*).—Height about 4 ft. Best recorded horns measure: Length, 1 ft. 10 in.; girth, 10¼ in.; tip to tip, 11¼ in.

Coke's Hartebeest or **Kongoni** (*Bubalis cokei*).—Height about 4 ft. Weight from 300 lbs. to 340 lbs. The finest pair of horns yet recorded measure 1 ft. 8¾ in. over the curve. Another pair measures: Length, 1 ft. 8 in.; girth, 9 in.; tip to tip, 13½ in.

Swayne's Hartebeest (*Bubalis swaynei*).—Height, 4 ft. or a trifle under. Weight about 300 lbs. Best recorded measurements of a single head, shot by Col. H. G. C. Swayne: Length, 20¼ in.; girth, 8⅞ in.; tip to tip, 26¾ in.

Bontebok (*Damaliscus pygargus*).—Height, 3 ft. 6 in. to 3 ft. 8 in. Weight, 200 lbs. to 210 lbs. Maximum horn measurements, which are those of a pair in the British Museum, are: Length, 1 ft. 4⅜ in.; girth, 6¾ in.; spread at tips, 9⅛ in.

[*Photo. by W. S. Berridge, F.Z.S.*

BONTEBOK.

[*Mounted by Rowland Ward, Piccadilly, W.*
OKAPI.

Okapi (*Ocapia johnstoni*).—Height about 4 ft. Weight probably about 450 lbs.

Tora Hartebeest (*Bubalis tora*).—Height about 4 ft. Weight 350 lbs. to 400 lbs. Measurements of best horns yet recorded: Length, 22½ in.; girth, 9 in.; tip to tip, 22⅜ in.

West African Hartebeest (*Bubalis major*).—Height about 3 ft. 8 in. to 3 ft. 10 in. Maximum horn measurements from different specimens: Length, 26¾ in.; girth, 13½ in.; tip to tip, 13¾ in.

Bubal Hartebeest (*Bubalis boselaphus*).—Height at shoulder, 43 in. or 44 in. Very few specimens of heads have been seen in Europe. The best recorded pair of horns—in the British Museum—measure: Length, 14½ in.; girth, 8⅝ in.; tip to tip, 9⅜ in.

Korrigum or **Senegal Hartebeest** (*Damaliscus corrigum*).—Height, 3 ft. 10 in. to 4 ft. The best recorded pair of horns measure: Length, 26¾ in.; girth, 9⅛ in.; tip to tip, 15⅛ in.

Topi (*Damaliscus corrigum jimela*).—Height about 4 ft. Weight about 350 lbs. The best pair of horns yet recorded measure: Length, 22¼ in.; girth, 8½ in.; tip to tip, 5¾ in.

Tiang (*Damaliscus corrigum tiang*).—Slightly inferior in height to the Topi. Measurements of best horns yet recorded are: Length, 25⅞ in.; girth, 9¾ in.; tip to tip, 11½ in.

Hunter's Hartebeest (*Damaliscus hunteri*).—Height about 4 ft. Maximum measurements of different horns: Length, around curve, 2 ft. 2¼ in.; in straight line, 1 ft. 10½ in.; girth, 8⅜ in.; spread at tips, 1 ft. 3½ in.

Tsesseby, Sassaby, or **Bastard Hartebeest** (*Damaliscus lunatus*).—Height, 3 ft. 10 in. to 4 ft. Maximum measurements of different horns: Length, 1 ft. 4⅝ in.; girth, 8¼ in.; spread at tips, 1 ft. 1¾ in.

Red Deer (*Cervus elaphus*).—Height of a good stag, 4 ft. at shoulder. Weights of Scottish specimens range from 280 to 400 lbs., but one killed at Woburn more than seventy years ago weighed 476 lbs.= 34 stone. Greater weights are, however, attained by stags of Eastern Europe and Western Asia. A Continental stag, killed in recent years, weighed 584 lbs. Maximum measurements of different antlers: Greatest length over outside, 5 ft. 8 in., with a spread inside of 5 ft. 5 in.; this pair had forty-four points, and their weight was 74 lbs.; they were from Central Europe, probably Austria. The greatest spread, however—6 ft. 3$\frac{6}{10}$ in.—has been attained by a pair now in the King of Saxony's collection at Moritzburg, whose history dates back to 1586. Some of the prehistoric stags had antlers which carried astounding numbers of points, ranging from that given above to sixty-six. Between 1611 and 1656, the Elector of Saxony killed 24,563 stags, ranging from one of thirty points to 1,192 of fourteen, of which the heaviest stag weighed 61 st. 11 lbs.; 59 exceeded 56 stone; 651 exceeded 48 stone; 2,679 exceeded 40 stone; and 4,139 exceeded 32 stone. Since that time, the deterioration of the German stags has been as marked as that of the British. In Northern Hungary, and in the Carpathian Alps, stags are still sometimes met with of the clean weight of from 35 to 40 stone.

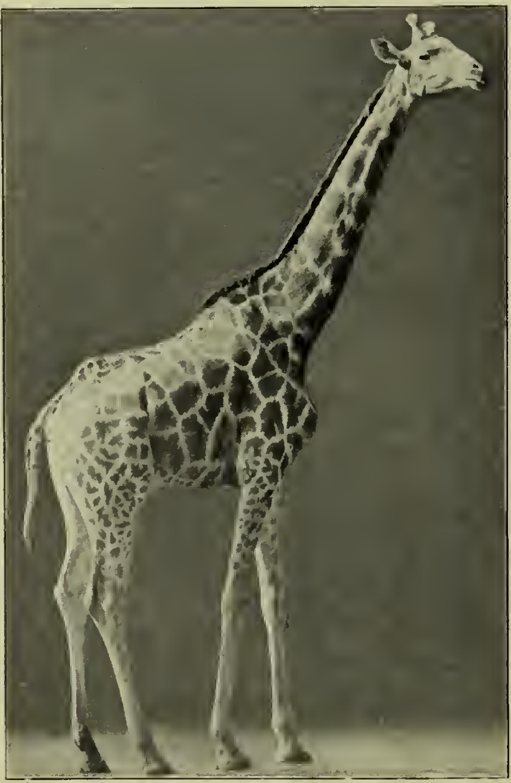
[*Photo. by W. S. Berridge, F.Z.S.*
RED DEER STAG.

Of British deer, the record head belongs to a Scottish stag shot in Inverness-shire in 1794, now in the possession of Col. W.

Hall Walker. The measurements are: Length on outside curve, 41 in.; girth between bez and trez, 7 in.; widest inside, 35 in.; points, 7 and 7. An Exmoor head, in the possession of Sir John Heathcoat Amory, measures: Length, 41 in.; girth, 5¼ in.; widest inside, 32¼ in.; points, 5 and 5. A stag shot by Lord Burton in Glen Quoich in 1893 carried 20 points, 10 and 10. A stag in Mr. C. Lucas's park at Warnham, Sussex, developed antlers in 1891 which carried 47 points. Good feeding had much to do with this result.

Prong-horned Antelope (*Antilocapra americana*).—Height at shoulder about 3 ft. Weight, about 80 lbs. clean. Maximum measurements of different horns: Length, 1 ft. 5¼ in.; girth, 6½ in.; widest inside, 12½ in.

Maral or **Eastern Red Deer** (*Cervus elaphus maral*).—Height about 4 ft. 6 in. Weight from 500 lbs. to 700 lbs. The finest antlers yet recorded measure: Length, 4 ft. 0½ in.; girth, 6 in.; widest inside, 41½ in.; points, 5 and 6. The late Prince E. Demidoff secured in the Caucasus a head carrying 21 points.



[*Photo. by W. P. Dando. F.Z.S.*

GIRAFFE.

Giraffe (*Giraffa camelopardalis*).—Height of males, 18 ft. to 19 ft. to top of horns; females about 2 ft. less.

Wapiti (*Cervus canadensis*).—This, which is called in America, of course erroneously, the "Elk," attains large proportions, and is probably not specifically distinct from the Thian Shan Stag and other Asiatic varieties. Height of stags from 5 ft. 4 in. to 5 ft. 6 in. Length, from tip of nose to tail, 8 ft. to 9 ft.; girth of body over heart, 6 ft. to 6 ft. 8 in.; weight, from 700 to 1,000 lbs. Measurements of finest recorded antlers: Length along beam, 5 ft. 10¼ in. and 5 ft. 10 in.; girth, 1 ft. 2⅛ in.; widest outside, 5 ft. 8 in.; widest inside, 4 ft. 1 in. Number of points, twelve. Seventeen, eighteen, and twenty pointers have been recorded; these, however, are very rare examples.

[*Photo. by W. S. Berridge, F.Z.S.*

WAPITI STAG.

Barbary Stag (*Cervus elaphus barbarus*).—Record antlers measure: Length, 3 ft. 2⅞ in.; girth, 5⅜ in.; points, 6 and 5.

Kashmir Stag or **Hangul** (*Cervus cashmirianus*).—Height, 4 ft. to 4 ft. 4 in. Average weight about 400 lbs. Maximum measurements of different antlers: Length, 4 ft. 0⅛ in.; girth, 7⅝ in.; spread, from tip to tip, 3 ft. 2 in.; width inside, 3 ft. 11½ in. A pair recorded by the late Sir Victor Brooke had sixteen points.

Yarkand Stag (*Cervus yarcandensis*).—Record horns: Length, 3 ft. 4¼ in.; girth, 5½ in.; tip to tip, 23¾ in.; widest inside, 31¾ in.; points, 5 and 5. A thirteen-pointer (7 and 6) has been recorded.

Sikkim Stag or **Shou** (*Cervus affinis*).—Height up to 5 ft. Maximum measurements of different antlers: Length, 4 ft. 7¾ in.; girth, 8 in.; spread between tips, 3 ft. 2 in.; width inside, 3 ft. 9½ in. Greatest number of points, fourteen.

Japanese Sika (*Cervus sica typicus*).—Height about 2 ft. 8 in. to 2 ft. 10 in. Weight about 180 lbs. Best recorded antlers measure: Length, 2 ft. 1½ in.; girth, 5 in.; tip to tip, 17⅜ in.; points, 4 and 4. Nine-pointers have been recorded.

[*Photo. by W. P. Dando, F.Z.S.*

JAPANESE SIKA DEER.

Thorold's Deer (*Cervus albirostris*).—The best recorded antlers (British Museum) measure in length 3 ft. 11 in. Greatest girth measurement, 5¼ in.; tip to tip, 3 ft. 1 in.; widest inside, 2 ft. 8 in. Ten points are the largest number yet recorded.

Thian Shan Wapiti (*Cervus canadensis songaricus*). — Best horn measurements hitherto recorded: Length, 4 ft. 7 in.; girth, 8 in.; points, 6 and 7. Another pair measured: Length, 4 ft. 6 in.; girth, 7¼ in.; tip to tip, 4 ft. 1 in.; widest inside, 3 ft. 10¾ in.; points, 7 and 6.

Bactrian Wapiti (*Cervus canadensis bactrianus*).—This wapiti, from Tchenkend and other parts of Turkestan, is at present very little known. A head in the possession of the Duke of Bedford measures: Length, 3 ft. 6 in.; girth, 6 in.; tip to tip, 2 ft. 2¼ in.; points, 6 and 4 (*Records of Big Game*).

Manchurian Wapiti (*Cervus canadensis xanthopygus*). — Best recorded antlers measure: Length, 2 ft. 9¼ in.; girth, 5¾ in.; widest inside, 1 ft. 9½ in.; points, 6 and 6. Fifteen points, 8 and 7, have also been recorded (*Records of Big Game*).

Siberian Wapiti (*Cervus canadensis asiaticus*).—Of this little-known wapiti no measurements are yet available.

Manchurian Sika (*Cervus sica manchuricus*).—Height about 3 ft. 3 in. Record antlers measure: Length, 2 ft. 2 in.; girth, 4¼ in.; tip to tip, 13⅜ in.; points, 4 and 4. A span from tip to tip of 1 ft. 9½ in. has been recorded.

Formosan Sika (*Cervus taëvanus*).—Height just under 3 ft. Best recorded antlers (British Museum) measure: Length, 1 ft. 7¾ in.; girth, 3⅜ in.; tip to tip, 13 in.; widest inside, 16⅜ in.; points, 4 and 4.

Pekin Sika (*Cervus hortulorum*).—Height at shoulder in good specimens as much as 4 ft. Best recorded antlers measure: Length, 2 ft. 8¼ in.; girth, 4½ in.; tip to tip, 16¼ in.; points, 4 and 4. A ten-pointer (5 and 5) has been recorded.

Malay Sambar (*Cervus unicolor equinus*).—Height and weight slightly less than in the Indian species. Best recorded measurements, different heads: Length, 2 ft. 8½ in.; girth, 8¼ in.; tip to tip, 2 ft. 3¾ in.; widest inside, 2 ft. 3¼ in. Usual points, 3 and 3, but 7 and 7 have been recorded.

Formosan Sambar (*Cervus unicolor swinhoei*). — Maximum antler measurements, from a head in the British Museum: Length, 1 ft. 7¾ in.; tip to tip, 9 in.; points, 3 and 3.

Basilan Sambar (*Cervus unicolor nigricans*).—A head in the British Museum measures: Length, 13½ in.; girth, 4⅜ in.; tip to tip, 12⅛ in.; points, 3 and 3.

Axis, Indian Spotted Deer, or **Chital** (*Cervus axis*).—Height very variable, that of a buck in Northern and Central India being from 3 ft. to 3 ft. 3 in., whilst in Southern India the height attained is from

[*Photo. by W. S. Berridge, F.Z.S.*

AXIS.

2 ft. 6 in. to 2 ft. 8 in.; weight from 145 lbs. to 200 lbs. Maximum measurements of different antlers: Length, 3 ft. 3 in.; girth, 5¾ in.; spread between tips, 2 ft. 1¼ in. Greatest number of points, ten.

Luzon Sambar (*Cervus unicolor philippinus*).—Maximum measurements, from a single head in possession of Sir Edmund Loder: Length, 1 ft. 9 in.; girth, 4¾ in.; tip to tip, 5½ in.; points, 3 and 3. A tip to tip span of 14¾ in. has been recorded.

Indian Sambar (*Cervus unicolor typicus*).—Height, 4 ft. 6 in.; weight of large specimens, 600 to 700 lbs. Maximum measurements of different antlers: Length around outside, 4 ft. 2⅛ in.; girth above brow-tine, 9⅜ in.; spread between tips, 4 ft. 1 in.; width inside, 3 ft. 9⅞ in. Greatest number of points, twelve, but in nine-tenths of the specimens recorded the number is 3+3.

[*Photo. by W. P. Dando, F.Z.S.*
SAMBAR STAG.

Szechuen Sambar (*Cervus unicolor dejeani*).—Of this sambar, found in North-West China, very few heads have reached Europe. The finest recorded example, in the Museum of the Hon. Walter Rothschild, measures: Length of antlers, 3 ft. 5 in.; girth, 6 in.; tip to tip, 22 in.; points, 3 and 3.

Javan Rusa Deer (*Cervus hippelaphus*).—The best antlers yet recorded, in the possession of H.M. the King, measure: Length, 3 ft. 1½ in.; girth, 5⅜ in.; tip to tip, 16 in.; points, 3 and 3.

Moluccan Rusa (*Cervus hippelaphus, moluccensis*).—Record antlers: Length, 3 ft. 0⅛ in.; girth, 4⅝ in.; tip to tip, 18¼ in.; points, 3 and 3.

Hog Deer (*Cervus porcinus*).—Height, from 2 ft. to 2 ft. 5 in.; weight as shot, 96 lbs. Maximum measurements of different antlers: Length, 1 ft. 11¼ in.; girth above brow-tine, 4½ in.; spread between tips, 1 ft. 10½ in.

Swamp Deer or **Barasingha** (*Cervus duvauceli*).—Height of stags, 3 ft. 8 in. to 3 ft. 10 in.; weight of large specimens from 30 stone upwards. Maximum measurements of different antlers: Length around outside, 3 ft. 5 in.; girth, 6½ in.; spread between tips, 3 ft. 11 in.; width inside, 3 ft. 2 in. Greatest number of points, fifteen.

Schomburgk's Deer (*Cervus schomburgki*).—Height about 3 ft. 5 in. Record antlers measure: Length, 3 ft. 8⅛ in.; girth, 5⅛ in.; points, 12 and 11. Widest inside measurement, 2 ft. 9 in.

Thamin or **Eld's Deer** (*Cervus eldi*).—Height, 3 ft. 9 in. to 4 ft. 3 in. Average weight, 220 lbs. Best measurements (single head): Length, 3 ft. 6 in.; girth, 5 in.; widest inside, 24 in.; points, 3 and 2. As many as twenty small points have been recorded, and in one case 16 and 19. A good head of 3 ft. 5 in. carried 12 points, 7 and 5.

Fallow Deer (*Cervus dama*).—Height, about 3 ft. Weight from 140 lbs. to 200 lbs., clean. Maximum measurements of different antlers: Length, 2 ft. 6 in.; girth, 5 in.; width of palm, 8 in.; spread between tips, 2 ft. 8½ in.; width inside, 2 ft. 6 in. Greatest number of points, thirty.

Mesopotamian Fallow Deer (*Cervus* (*dama*) *mesopotamicus*).—Bigger and heavier than the common species. Weight of a buck (clean) about 24 stone. Record antlers: Length, 3 ft. 0½ in.; girth, 4¾ in.; palm width, 5⅜ in.; tip to tip, 16¾ in.; points, 27 (15 and 12).

Muntjac, Barking Deer, or **Kakar** (*Cervulus muntjac*).—Height, from 1 ft. 8 in. to 1 ft. 10 in. Weight, 28 lbs. to 40 lbs. Average length of good antlers, 3 in. or 4 in. on pedicles of 4 in. or 5 in.; but a maximum length of 10⅜ in. has been attained.

Reindeer or **Caribou** (*Rangifer tarandus*).—Notwithstanding the constantly reiterated opinions of sportsmen as to the specific distinctions between the Old World Reindeer and the New World Reindeer or Caribou, whether Woodland or Barren-ground, it will be better to consider that there is but one species, variable in size and coloration according to geographical distribution. Curiously few body-measurements or weights of the Old World form appear to have been recorded. The height of Finnish Reindeer is stated to reach 48 in. at shoulder and 51½ in. at loins, the typical Swedish reindeer standing only 44½ in. at shoulder and 45¾ in. at loins.

Measurements of an American "Woodland Caribou" bull are: Length from nose to root of tail, 6 ft. 7 in.; height at shoulder, 4 ft. 5 in.; height behind saddle on rump, 4 ft. 7 in.; girth behind forelegs, 5 ft. 1 in.; length of neck (along top), 1 ft. 5 in.; weight (estimated), 400 lbs. A Newfoundland caribou has measured 4 ft. 10 in. at shoulder. Of the antlers—which, unlike those of other deer, are borne by the female as well as by the male—the maximum length is given as 5 ft. 2 in. Maximum girth, 7¼ in.; spread between tips, 4 ft. 0¾ in.; widest inside, 4 ft. 6 in. Greatest number of points, 20+30=50; this in a specimen in the Vienna Museum. Norwegian antlers, which appear to be smaller, have attained 33 points, and the best measurements, in the order given above, are 4 ft. 11½ in.; 7 in.; 3 ft. 6½ in.; and 3 ft. 8 in.

Elk or **Moose** (*Alces machlis*).—This, the greatest of all living deer, known in the Old World as the Elk, and in the New World as Moose, sometimes attains a height of 18 hands or more. A good Scandinavian Elk will stand 5 ft. 9 in. at the withers, while the moose of Alaska, especially in the Kenai Peninsula, have been known to attain from 6 ft. 6 in. to 7 ft. Some of the gigantic beasts killed in this part of North America weigh as much as 1,600 lbs., or perhaps even more. The estimated weight of an Elk killed in Lithuania by Count Scheibler was 1,500 lbs. This beast measured 5 ft. 9 in. at the shoulder. The finest head mentioned in *Records of Big Game*, which came from the Yukon, and is in the possession of Mr. W. F. Sheard, had a greatest width of 6 ft. 6½ in.; length, 4 ft. 1 in.; breadth of palm, 18 in.; points, 40. A longest antler measurement of 4 ft. 7½ in. has been recorded, a palm breadth of 23 in., and as many as 47 points. These were from Alaskan examples. The record European head—a Norwegian specimen—has a greatest width of 4 ft. 4 in.; length, 2 ft. 8 in.; breadth of palm, 9 in.; points, 18. A palm breadth of 15½ in. has been recorded of another Norwegian example, and a 22-point head from Lithuania.

Roe Deer (*Capreolus caprea*).—Height about 2 ft. 2 in. Weight varies from 40 lbs. to as much as 65 lbs. Maximum length of horns, 1 ft. 1 in.; girth, 4 in.; tip to tip, 14½ in. This was a German example. The best British head was one secured by Mr. R. Moncrieff, in Perthshire, which measured 1 ft. 0⅛ in. Anything over 9 in. is an exceptional head.

Siberian Roe (*Capreolus pygargus*).—A considerably bigger beast than the European roe, measuring at shoulder from 2 ft. 4 in. to 2 ft. 10 in. Record head measures in length 18$\frac{9}{16}$ in.; girth, 6¾ in. Another head in the Tring Museum (Hon. Walter Rothschild's) measures: Length, 17¾ in.; girth, 4 in.; tip to tip, 12⅛ in. This was from the Thian Shan range.

Virginian or **White-tailed Deer** (*Mazama americana*).—Very variable in size. Weight, 175 lbs. to 200 lbs. Maximum measurements of different antlers: Length of one antler in British Museum, 2 ft. 3⅝ in., with girth, 5⅜ in. Greatest spread between tips, 1 ft. 6⅛ in. Widest inside, 1 ft. 8 in. Points, fifty-two. This last is, of course, an abnormal head. A twelve-point head is an average good one.

Guanaco (*Lama guanacus*).—Height of full-grown male, about 4 ft. Length, from 7 ft. to 8 ft.

[*Photo. by W. S. Berridge, F.Z.S.*

GUANACO.

Pampas Deer (*Mazama campestris*).—Height, about 2 ft. 6 in. Maximum measurements of different horns: Length, 1 ft. 2⅝ in. Girth, 4¾ in. Spread between tips, 1 ft. 1¼ in. Points, normally 6, but 23 have been recorded.

Marsh Deer (*Mazama dichotoma*).—Size about that of a red deer. Record antlers measure: Length, 2 ft. 1⅛ in.; girth, 5 in.; tip to tip, 1 ft. 10¼ in.; points, 13. As many as 28 points have been recorded.

Mule-Deer (*Mazama hemionus*).—Often called, in Colorado, the "Black-tail," which can only be properly applied to the next species. Height about 3 ft. 4 in. A good stag will weigh as much as 17 stone or a little over. Maximum measurements of different antlers: Length, 2 ft. 9¾ in. Girth, 6½ in. Spread between tips, 2 ft. 5½ in. Width inside, 3 ft. 0¼ in. Points, forty.

Black-Tailed Deer (*Mazama columbiana*).—Weight, about 200 lbs. Maximum measurements of different antlers: Length, 2 ft. 5½ in. Girth, 6 in. Spread between tips, 1 ft. 5 in. Width inside, 1 ft. 7¼ in. Points, fifteen.

There are various small deer, such as the Musk and the Chevrotains, characterised by the absence of horns and the presence of tusks, which may be passed over here, as, indeed, may be the camels, which are only found in a semi-wild state, or escaped from an ancient captivity.

Wild Pig or **Wild Boar** (*Sus scrofa*).—Whether the European Wild Boar is specifically distinct from the Indian is rather a vexed question, but Mr. Lydekker, who is an accomplished biologist, and in the best position for judging, inclines to that belief; it is, therefore, to the former that the following measurements belong:—Height, about 2 ft. 9 in. Extreme weight, 400 lbs. Maximum length of tusk round outside curve, 13 in.

[*Photo. by W. S. Berridge, F.Z.S.*
EUROPEAN WILD PIG.

Indian Wild Pig or **Boar** (*Sus cristatus*).—Height, from 2 ft. 6 in. to 3 ft. 4 in. at shoulder. Weight, from 200 lbs. to 300 lbs., or over. Maximum length of tusks of lower jaw, 14⅜ in. A malformed tusk, which had grown almost into a circle, measured 14¾ in.

[*Photo. by W. S. Berridge, F.Z.S.*
INDIAN WILD PIG.

Wart Hog (*Phachochœrus æthiopicus*).—Height about 30 inches. Weight from 200 lbs. to 230 lbs. Record tushes measure 27 in. and 26 in. respectively over the curve.

[*Photo. by W. S. Berridge, F.Z.S.*
WART HOG.

Forest Hog (*Hylochœrus meinertzhageni*).—Considerably exceeds the Wart Hog in size. Tusks from a specimen in the Tring Museum measure: Upper tusks, 10¼ in. and 9¾ in.; lower tusks, 9 in and 8½ in.

Babirusa (*Babirusa alfurus*).—Height from 27 in. at shoulder to 3 ft. 6 in. at middle of back. Weight, 128 lbs. and upwards. Record tusks: Upper, 17 in. Of another pair the upper tusks measured 16¾ in.; the lower, 13½ in.

[*Photo. by W. S. Berridge, F.Z.S.*
BABIRUSA.

Hippopotamus (*Hippopotamus amphibius*).—Height at shoulder, about 3 ft. 10 in. to 4 ft. An old male, measured by Sir Samuel Baker, was 14 ft. 3 in. from snout to end of tail, this being about 9 in. Another measured 15 ft. 10 in. Weight of fresh hide, about 5 cwt. One hippo of a

[*Photo. by W. S. Berridge, F.Z.S.*
HIPPOPOTAMUS.

length of 12 ft., kept in confinement, weighed about 4 tons. Maximum tusk-measurements, different examples: Length around outside curve, 5 ft. 4½ in. Girth, 10⅜ in. Weight of a good pair, 15 lbs.

Indian Rhinoceros (*Rhinoceros unicornis*).—Height at shoulder, 5 ft. 9 in. to 6 ft. 4¼ in. Horn measurements: Jerdon mentions one 2 ft. in length, and there is one in possession of Lord Curzon which measures: Length, 1 ft. 9½ in.; girth, 2 ft. 0¾ in.

[*Photo. by W. S. Berridge, F.Z.S.*
INDIAN RHINOCEROS.

Javan Rhinoceros (*Rhinoceros sondaicus*).—Sterndale gives the height at shoulder as 5 ft. 6 in.; length, 12 ft. 3 in., including tail of 2 ft. 4½ in. Horn of one in British Museum measures: Length, 10⅝ in.; girth, 1 ft. 7⅝ in.

Sumatran Rhinoceros (*Rhinoceros sumatrensis*).—Height at shoulder, 4 ft. to 4 ft. 6 in.; length, tip of snout to root of tail, 8 ft.; weight, about 2,000 lbs. Maximum length of anterior horn, 2 ft. 8⅛ in., with girth, 1 ft. 5⅜ in. Longest posterior horn, 17 in.

[*Photo. by W. S. Berridge, F.Z.S.*
SUMATRAN RHINOCEROS.

African Black Rhinoceros (*Rhinoceros bicornis*).—Sir Samuel Baker and Selous state that the males may attain a height of from 5 ft. 6 in. to 5 ft. 8 in. at shoulder. An adult female stood 4 ft. 8½ in.; length, tip of snout to root of tail, 4 ft. 11½ in.; tail, 1 ft. 9½ in. Maximum measurements: Anterior horn, length, 4 ft. 5½ in.; girth, 1 ft. 6¼ in. The next best pair measure: Anterior horn, 3 ft. 11 in.; girth, 22 in. Posterior horn: 1 ft. 10¾ in.; girth, 20 in.

[*Photo. by W. S. Berridge, F.Z.S.*
AFRICAN BLACK RHINOCEROS.

White or Burchell's Rhinoceros (*Rhinoceros simus*).—Height at shoulder, maximum 6 ft. 6 in. One, a male, mentioned at p. 329, P.Z.S., 1894, measured 6 ft. 1½ in. at the withers; length between uprights, 12 ft. 1 in.; girth behind shoulders, 10 ft. 3½ in.; round fore-arm, 3 ft. 4½ in.; anterior horn measures 2 ft. 3 in. Maximum length of anterior horn, 5 ft. 2½ in., with girth, 1 ft. 10½ in. Another, in the British Museum, measures 4 ft. 8½ in., with a girth of 1 ft. 11½ in. Posterior horns are noted of 1 ft. 5⅞ in. in length; maximum girth, 2 ft. 1½ in.

Indian Elephant (*Elephas indicus*).—Average height of adult male, about 9 ft.; of adult female, 8 ft. A first-class "Koomeriah" or thoroughbred, which was probably sixty years of age, is stated by Sanderson to have measured 9 ft. 2 in. at shoulder. Sterndale gives 10 ft. 7½ in. as the maximum authentic record, but a specimen killed by the late Sir Victor Brooke is said to have stood 11 ft.; and for another, whose skeleton now stands 11 ft. 3 in. in the Museum at Calcutta, an original height of 12 ft. is claimed, the same height being also attributed to a Ceylon example. An elephant's height is often said to be normally double the girth of its forefoot. The weight of an adult specimen does not appear to have been recorded, but a young male at the Zoological Gardens in 1881, whose height was 8 ft., weighed 2 tons, 17 cwt., 1 qr., 23 lbs.; and another, 7 ft. 6 in. in height, weighed 2 tons, 11 cwt., 0 qr., 23 lbs. The maximum tusk-measurements pertain to a pair in the possession of the late Earl of Lytton, which measured respectively 8 ft. 9 in. and 8 ft. 2 in. These weighed 81 lbs. and 80·2 lbs. each. A tusk measuring 8 ft. from the very large elephant killed by Sir Victor Brooke weighed 90 lbs.

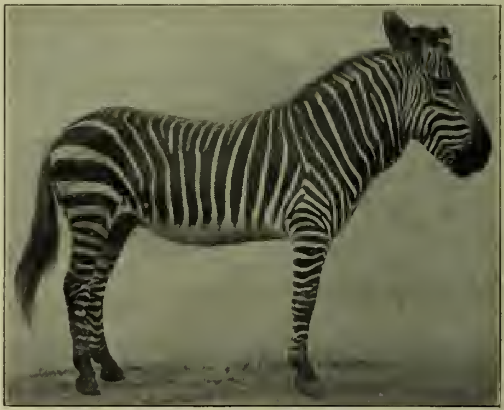
Greater weights have, however, been recorded, one from South India attaining 109 lbs., and another from Burma, 106 lbs.

African Elephant (*Elephas africanus*).—The dimensions and weight of a male specimen, killed by H.R.H. the Duke of Saxe-Coburg, are given as: Height at withers, 10 ft.; girth, 16 ft. 6 in.; length of ear, 4 ft. 6 in.; entire weight, 4 tons, 8 cwt., 4 lbs. Of another male, killed by Sir John Kirk, the dimensions were: Height, 10 ft. 3 in.; maximum girth, 18 ft.; girth of fore-foot, 5 ft. 1 in.; width of ear, 3 ft.; length, 5 ft. 9 in. The respective dimensions of two elephants, shot by Selous and Jameson, are given as: Height at shoulder, 10 ft. and 10 ft. 4 in.; length of ear, 5 ft. 5 in. and 5 ft. 6½ in.; breadth, 3 ft. 3 in. and 3 ft. 4 in.; girth of fore-foot, 4 ft. 4½ in. and 4 ft. 7½ in. The renowned "Jumbo" stood 11 ft. at withers, and weighed 6 tons, 10 cwt. The largest wild elephant is one recorded by Mr. N. Weld Blundell in Abyssinia, which measured 11 ft. 8¼ in. at shoulder. Another secured by Messrs. E. S. Grogan and G. A. S. Cape near Wadelai, taped 11 ft. 6 in. The late Mr. A. H. Neumann shot a bull elephant in East Africa which measured 11 ft. 3 in.

The dimensions and weight of a baby elephant, aged one hour, are stated to have been: Height at shoulder, 2 ft. 10½ in.; length of trunk, 1 ft.; tail, 1 ft. 8 in.; girth at thorax, 3 ft. 9 in.; at abdomen, 4 ft. 1 in.; at base of trunk, 9 in.; of fore-foot, 1 ft. 5 in.; weight, 213 lbs.

Maximum tusks recorded: Length of a pair in the possession of Mr. Rowland Ward, 11 ft. 5½ in. and 11 ft. respectively. These weighed 293 lbs. the pair. A single tusk belonging to Sir Edmund Loder measures 10 ft. 4 in., has a girth of 2 ft. 2 in., and weighs 235 lbs. Another tusk, in the British Museum, is 10 ft. 2½ in. long, has a girth of 24½ in., and weighs 226 lbs. All these magnificent teeth were from East Africa.

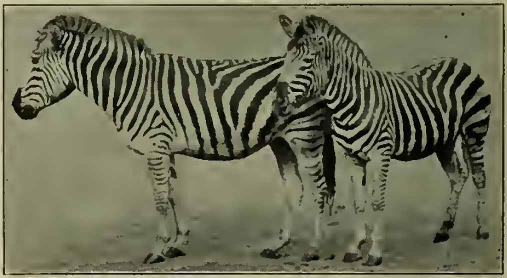
Mountain Zebra (*Equus zebra*).—Height at withers, 4 ft. to 4 ft. 2 in.



[*Photo. by W. S. Berridge, F.Z.S.*

MOUNTAIN ZEBRA.

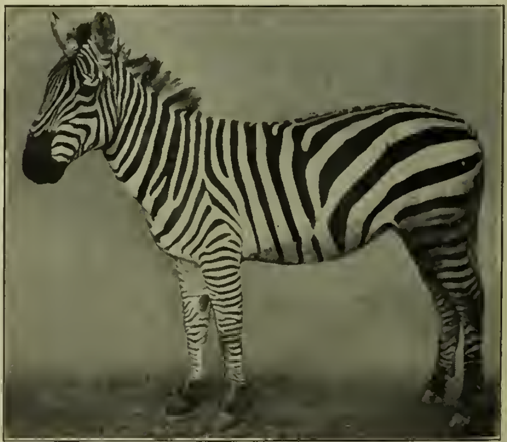
Burchell's Zebra (*Equus burchelli*).—Height, 4 ft. 4 in. to 4 ft. 6 in.



[*Photo. by W. S. Berridge, F.Z.S*

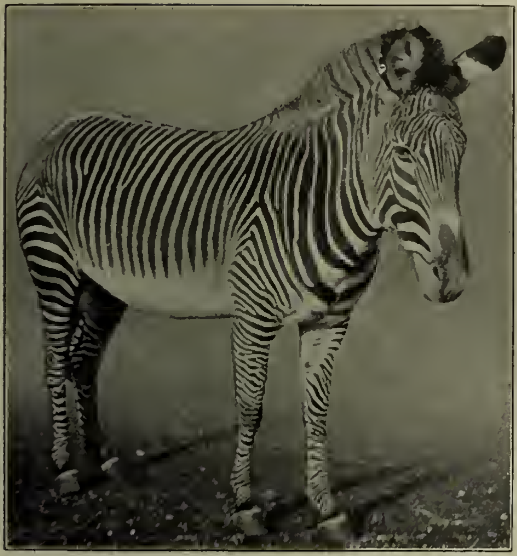
BURCHELL'S ZEBRA.

Grant's Zebra (*Equus burchelli granti*). Height, 3 ft. 11 in. to 4 ft. 2 in.



[*Photo. by W. S. Berridge, F.Z.S.*

GRANT'S ZEBRA.



[*Photo. by W. S. Berridge, F.Z.S.*

GREVY'S ZEBRA.

Grevy's Zebra (*Equus grevyi*).—Height, 4 ft. 10 in. to 5 ft.

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BIG HORN (*Ovis canadensis*).—This magnificent animal ranks high from a sportsman's point of view among the Big Game of North America. Although becoming scarce elsewhere, it is still very plentiful in British Columbia, especially in the district of Sheep Creek, East Kootenay, where it is preserved by a close time and a limit on the quantity to be killed.

Probably no animal is keener of scent, sight, and hearing; often, high up the mountain side, it will spend hours upon a solitary rock gazing into the depths below where no movement escapes its notice. Most necessary is it therefore to circle widely round one which may have been sighted, and approach it only from above, and that with the greatest caution, lest a dislodged pebble should give the alarm. At certain seasons large bands of rams herd together high up the mountains; at other times most mixed bands contain at least one old ram, and occasionally two or three old rams appear to wander about by themselves.

Shooting.—There are three modes of hunting these sheep. The most legitimate of these is by fair stalking, when the man who scores a fine head will have many reasons to remember the exciting climb it entailed. In some districts trained dogs are used, and when a ram is sighted these are laid on, quickly bringing the animal to bay on some projecting rock, where, if the dogs know their work, they will detain him until the hunter arrives within range. A ram is easily approached under these conditions, for it seems to see nothing but the dogs.

Big Horn.
Height at shoulder, 3 ft. 2 in.; av. horn meas. 35 in.; max. horn meas. 45 in.

The third method entails constantly watching "Licks," whither sheep make periodical excursions, singly and in bands, from the mountain tops to gorge themselves with clay. They may remain from an hour to two days, and when killed their stomachs will be found full of nothing but the clay formed from denuded limestone, which they lick and gnaw until sometimes deep tunnels are formed in the steep cliffs large enough completely to hide six or seven sheep. The hunter standing over one of these warrens may bolt them like rabbits within two yards of him. Although many big rams may be killed at licks, it scarcely repays the time wasted in fruitless visits. In the dead of winter sheep often come into the valleys and feed off fallen fir trees. At such times they may be seen mixed with white and black tailed deer, low down on a river's bank, and I have known them approach within forty yards of an inhabited log hut.

No North American animal affords better sport, none carries a handsomer head; but it is rare to secure a fine one with perfect tips to the horns, about three inches being nearly always worn off from constant contact with rocks. It is scarcely necessary, however, to mention that the old idea of sheep leaping down precipices and alighting on their horns is one of the many fallacies long exploded

J. TURNER-TURNER.

BILLIARDS—**Introductory.** — During the past fifty years the game of Billiards has advanced from the disreputable to the highly respectable, and now deservedly occupies the position of a first-class indoor game. It possesses advantages over any other game. It can be played by daylight and by gaslight, by both sexes, and there is no reason why a lady should not play equally as well as a gentleman; in fact, I have played with a lady who has scored a break of thirty, and have heard of others whose powers are much in excess of this. Consequently, we may in the future hear of the lady champion of billiards, just as we now hear of the lady champion of lawn tennis or golf.

During wet weather, or when a bleak east wind is blowing, and outdoor recreation is unpleasant, healthy exercise can be obtained in the billiard-room. There is sufficient excitement in the game to make it interesting without any money stakes. To become a good player requires thought and judgment, eye, nerve, and good temper; patience under adversity, and skill to take advantage of the openings that offer.

Although a full-sized table requires a large room, yet miniature tables can be procured on which an interesting game can be played, and tables are now constructed in such a manner that when inverted they can be used for dining-tables. The full-sized table, however, is now usually to be found in every club, mess, and country house. It is even sanctioned for soldiers' recreation rooms; and instead, as was predicted by officers of the old school, of leading to gambling and swindling, it seems to have produced the opposite effect.

The prejudice that was formerly displayed against billiards was, perhaps, not without cause. It was played principally in public-houses, and the players were not always those who belonged to the respectable class. These men studied the game for the sole purpose of being able to win money from the unwary. The rooms were dirty, and drinking was considered a necessary accompaniment of the game.

As an example of the prejudice against billiards held by certain gentlemen of the old school, I will refer to my own experience. When I was quite a child, my father had a billiard-table built and placed in our schoolroom for the amusement of himself and friends. The bed of the table was of wood, and the cushions stuffed with some elastic material. My first essays at strokes were made by aid of standing on a small stool, in order to reach to the level of the table. As a treat I was allowed to mark the game, which was registered on a dial. I thus very early became acquainted with "cannons," "hazards," "jennys," &c., and at ten years of age could play a fair game, without in the least suspecting there was anything disreputable in being able to do so. On joining the Royal Military Academy as a cadet, I found that by the standing orders any cadet known to enter a billiard-room was liable to seven days' arrest, while at the present time there is a billiard-room at the Academy at which cadets may play.

There were, however, even at that date, men possessing sufficient reason to conclude that if a man excelled in any one thing, he was more likely to be efficient in his military duties than were those who did nothing, and consequently excelled in nothing; whilst in the present day, to describe a man as an excellent billiard, whist, or chess player, would be considered complimentary rather than a disgrace. For it is most unlikely that a man who excels others in any one thing which can be so practically tested as can billiards, should be deficient in those qualities by which superiority can be judged. Some of those officers who have gained the greatest distinction in the examinations at our staff college are not those who have brought the greatest honour to our arms. When they should have given a miss under the cushion, they have played for a big break, and have lost the game. Hence there is more to be learned from a game of billiards than merely how to make cannons and hazards.

The Etiquette of the Billiard Room.—Before any person commences to learn the art of billiards, he should first become acquainted with the etiquette and rules of the billiard room and billiards. No man with proper feelings can desire to make himself a nuisance to those who are playing a game for his amusement, and it is essential that each person who enters a billiard room should be acquainted with what may be termed the etiquette.

The entrance door of almost every billiard room has in it small windows, through which the players may be seen. No person should enter the room, or even make a noise by touching the handle of the door, when either player is preparing for his stroke. Immediately the stroke has been made, and when the balls are running, then the room may be entered. A seat should be taken as soon as possible, but if no seat is vacant, the visitor should stand quite immovable when the players are aiming or making their strokes. To keep moving about the billiard room during the play, to walk in front of the player when he is making his stroke, to pull out a handkerchief and wave in front of the player, to strike a match for the purpose of lighting a pipe or cigar just as the player is on the stroke, or to jump up from a sitting position in order the better to see the table, are proceedings by no means uncommon in many billiard rooms where each person is supposed to be a refined gentleman. Such acts, however, are as great a breach of etiquette as could be committed, and are likely to cause even the least sensitive or nervous player to miss his stroke.

The billiard room may for the time being be justly considered as rented by the players, and consequently it should be regarded as their property; those persons who enter the room should consider the players only. Such a proceeding as loud talking, which renders the marker's call of the game almost inaudible, or even talking loudly enough to attract the attention of the player, is a breach of good manners. Another example of a want of knowledge of etiquette is when a player, having perhaps failed by a tenth of an inch to make a cannon, is additionally annoyed by one of the lookers-on giving a whistle, as though this whistler had suddenly been promoted from the gallery of a theatre to a club billiard room.

The marker is for the time being employed by the players, who have consequently a right to his services during the time they are using the table. No visitor ought therefore to take the attention of the marker from his special business, which is to mark and call the score, to decide as to a doubtful cannon or a foul stroke, to hand the rest, to spot the red ball if it is holed in a pocket, and to give the player his ball when a losing hazard has been accomplished. A marker has quite enough to do in marking the game, and attending to the other details of his special duty. For any person other than the players to employ him in any way is a breach of etiquette, if it withdraws his attention from the game. If a visitor find it necessary to employ the marker in any way, he should first ask the players if they object to his marking the game for a short time whilst the marker is otherwise employed.

Times and manners have changed during the past forty years, but when I was a young billiard player I considered that the best means of obtaining a knowledge of the game was to look on at good players, or to endeavour to play with some person who was a much better player than myself. If I happened to be playing a game with an opponent equally as unskilled as myself, and two very good players entered the room and put down their names for the table, I used either to give up the game at once, or shorten it to a named amount. To claim the table for my own feeble game, which might occupy fifty minutes, when there were players present who could finish the game in twenty minutes, was a proceeding I never adopted. It seemed unjust that two good players should pay one shilling for the use of the table for only twenty minutes, whilst I and my opponent could knock the balls about and occupy the table during fifty minutes for the same sum. Fairly good players will finish a game of 100 up in from twenty to twenty-five minutes, whilst bad players will occupy from forty to fifty minutes to score 100. Bad players, therefore, with good taste might limit their game to fifty up, when other names are down for the table. When no other players wish to play, then, of course, the game may be extended as far as is desired.

My early knowledge of the science of billiards was acquired by playing many hundred games with Charles Hughes, and afterwards with John Roberts, senior, when his billiard rooms were in Leicester Square; and whenever I could find a player who was more skilful than I was, a game with him was the object of my ambition. Young players in the present day usually adopt the opposite course. They seem to prefer knocking the balls about during fifty minutes or more, with an opponent as incompetent as themselves, either to playing with some persons from whom they can learn, or to watching the strokes of two good players. Lookers-on do not feel much interest in a game where the most simple hazards and cannons are missed three times out of four, and where the game advances merely by flukes or by the misses of the opponent. A sensible person who desires to learn the science of billiards would always prefer playing with an opponent who gave him 40 out of 100, than to playing with one to whom he gave 40 out of 100. Yet in many billiard rooms we find that the very opposite taste prevails, men preferring to play with those who they can easily defeat, and such persons will never become really good players.

Every person who is not playing should stand sufficiently far from the table to enable the players to move round and make their strokes without inconvenience. No looker-on has any right to make a remark as to what stroke should be played for, or whether the striker is playing the right game. He has a right to correct the score if the marker score incorrectly, but he may not call attention to a foul stroke, nor give any opinion unless appealed to. In fact, no assistance ought to be given to either player by a looker-on; the struggle is between the two players alone.

Whilst your adversary is playing, you should take the opportunity of chalking your cue, care being taken that no squeaking noise is produced by the process, which would be very likely to put the striker off his stroke; in fact, I have known it to be done purposely with that intention; you will then be at once ready to play when your opponent's break is finished. It is annoying, and also a waste of time, when a player whose turn it is to play commences to chalk his cue, and occupies probably half a minute in doing so. Some players seem to suffer from a condition of indecision, which is shown in the following manner: when their ball is in hand, and they can therefore place it in any part of baulk for their stroke, they will place their ball on the table and commence aiming at the ball at which they propose playing. Just as you imagine they are about to strike, they move their ball half an inch and aim again. A second and third time they will repeat this fidgety performance, and at last probably miss the ball at which they were aiming. Such practices are merely bad habits, which can be easily avoided.

In carrying your cue, take care that the point be carried over the table. I have seen some players who hold it in such a manner when walking about as to run the risk of poking out other people's eyes, while others, as if with the desire of correcting the course of their ball when in motion, will flourish their cues about in a manner which is positively alarming to anyone who is so unfortunate as to be in their immediate vicinity at the moment. I need hardly say that these are usually players of a highly nervous and excitable temperament, the possession of which is a serious drawback to anyone who is anxious to excel at the game.

The Usual Game of Billiards.—The billiard table and its fittings are now so well known that it is not necessary to enter into a description of its length and breadth, or the means by which it is constructed. Every individual who is likely to read an article on billiards will be almost certain to know the difference between a cue and the rest, between a cannon and a hazard, and between a winning and a losing hazard. All such details, therefore, will be assumed as known to the reader, and some suggestions will now be given as regards judging of the merits or condition of a billiard table and of the balls.

The perfection to which the science of billiards has attained is due mainly to the fact that the bed of the present table is accurately level, the balls perfect spheres and of equal weight, and the cushions true. With such materials to deal with, the enormous breaks now made by several professional players have been accomplished. Given a table which is not true, balls that are not perfect spheres nor equal in weight, and cushions that are not uniform, and Roberts himself would find a difficulty in making a break of more than 100.

There are so many billiard-table makers who turn out excellent work in the present day, that tables constructed by different makers differ but little from each other, except in the size of the pockets and in the height of the cushions, and these can be made to order to suit the taste of the purchaser.

There is a tendency in the present day to make the pockets smaller than formerly, a proceeding which results in fewer games being won by hard hitting and flukes. Small pockets, however, are not popular with the owners of public tables, as a game occupies a longer time, and the daily receipts from the table are consequently less than when the pockets are easy.

When the table and balls are perfectly true, the game may be played gently; a stroke can not only be made to a certainty, but the balls can be placed with accuracy for the next stroke. When the balls and table are "foul," to attempt a slow stroke when the balls have to run some distance is a proceeding very likely to cause the intended stroke to be missed, and to leave the adversary an easy score. To insure even moderate success with foul balls it is therefore necessary to hit harder, because the slower a foul ball travels the more will it diverge from a straight line. Billiards with foul balls, then, partake somewhat of the character of cricket, where hard hitters make the largest scores.

The usual method of testing whether a table is horizontal is by means of a long level, which should be placed on the table in various directions, reversed, &c. If the air-bubble in this level remain in the centre under all conditions, the table may be considered true so far as the bed is concerned.

To test the accuracy of the cushions, they should be looked at from a point in the prolongation of the cushion. If the cushion, instead of appearing as straight as a line, appear slightly jagged like a saw, such cushions are not perfectly true. To test whether a table be fast or slow, a ball may be placed in the centre of the baulk, and struck as hard as the player can strike it, the spot at the top of the table being aimed at, the number of times that the ball runs up and down the table being counted. Some players can, of course, make a ball travel faster than others, but each can test for himself, and compare the results on different tables. On a moderately fast table I can cause a ball to travel about four and a half times the length of the table. There are several other methods of testing the "strength," one very good method being to place the red ball in such a position that when you play from any part of the baulk, an easy losing hazard can be made in the middle pocket. By repeated trials it can then be found what is the amount of strength requisite to cause the red ball to strike the top cushion and to return to such a position as to make another and similar hazard almost a certainty. This stroke cannot be practised too often, and by attending to a few details which are given later, a good score may be made from these strokes alone.

An amateur who can be tolerably certain of making even eight or ten consecutive losing hazards in the middle pockets, and who plays other portions of the game with the same knowledge of strength, is a hard man to beat.

Another excellent method of testing the strength of the table is to place the red ball on the spot in the centre of the table. Place your own ball on the baulk line about two inches from the spot on the right. Play to hole your own ball in the right-hand top pocket, and strike with sufficient strength to cause the red ball to stop near the right-hand middle pocket, so as to leave either a winning or losing hazard in the middle pocket. This also is a stroke which cannot be practised too often; because when the red ball by faulty strength is not brought back far enough for a middle pocket hazard, one of the top pockets must be played for.

Players whose execution is nothing remarkable may, by a knowledge of strength, make very considerable breaks, especially when this knowledge of strength is combined with judgment.

When the cloth of a table is new, the table is slower than when the cloth becomes worn; also when the cushions are cold, they cause the ball to rebound with less velocity than when they are warm. Thus there is much to be done in gaining a knowledge of the strength of a table. Some players, after only a few strokes, will pick up with great accuracy the strength of a table, whereas many amateur players may play for a month on the same table, and then fail to have the slightest idea of the strength. One of the most marked differences between the professional and the amateur billiard player is in this knowledge of strength. A professional, or a first-class amateur, will make an easy cannon, and will either leave the balls for another easy cannon or for a hazard. The average amateur will make the cannon with as much ease as the professional, but he will play this with such want of judgment as regards strength that he will probably leave the balls widely separated, so that a second score is almost impossible. Players of this class I have always termed "one stroke players." They appear to think of nothing beyond the one stroke they may be playing. A long break with such players is almost impossible.

When John Roberts, jun., visited India, many of the natives who played a fairly good game remarked that there was really nothing wonderful in his play. Every stroke that he did they could do, but he had such extraordinary luck that he never had a difficult stroke to play for. The fact was that these men could not understand the real skill of the game, which consists not merely in making a stroke, but in playing this with such strength and judgment as to leave another easy stroke, and so on.

The Balls.—It is a very difficult thing to obtain three billiard balls that are perfectly true and of exactly equal weight. As ivory becomes more and more scarce, this difficulty will become greater, and recourse must be had to some of the modern composition balls, such as bonzoline or crystallate, with which excellent execution can be done so soon as a player becomes accustomed to the somewhat different angles at which they rebound from each other. These composition balls have, moreover, the additional merits of costing only about one-third the price of good ivory balls, and if quite true as regards weight and roundness when bought, are practically certain with fair usage to remain so indefinitely, which cannot be guaranteed in the case of ivory balls. The rough usage to which some amateurs subject the balls, may cause a set to be ruined and useless for accurate play. The player should strike a ball as though he loved it, unless the ball be so foul that it would not run true if struck gently.

In consequence of it being a very difficult thing, especially for an amateur, to strike a ball accurately, and thus to cause even a true ball to run on the table in a straight line, the balls are frequently accused of being "foul" when the foulness is in the way the ball has been struck. An excellent method to test the balls is to place a ball *A*, in front of and touching a ball *B*; with a third ball *C*, strike the ball *B*, the concussion will cause the ball *A* to run up or down the table in the same manner as though it had been struck true by the cue. If the ball *A* does not travel in a straight line, it must be because the ball is not true, or the table is not level. It is not difficult to decide which of these defects is the cause of the ball not running "true." For example, place the ball *A* so that the grain of the ivory identifies one side of the ball from the other, and make the stroke. Replace the ball in front of *B*, but now reverse the ball *A*, so that what was on the right is now on the left, and test again the course of the ball. If, after repeated trials, placing the ball *A* in various positions, it is found that this ball always diverges in one direction, we may be tolerably certain that it is the table that is foul. If, however, the ball sometimes diverges to the right, sometimes to the left, it is the ball that is foul.

Another very simple method is to place a ball in baulk, and strike this ball with sufficient force to cause it to run twice up and twice down the table; if the ball whilst running makes a sort of rattling noise, it is a foul ball, and instead of being a perfect sphere, inclined slightly to the shape of an egg.

The usual size of the billiard ball is $2\frac{1}{16}$ inches in diameter. When, however, a set of balls are purchased, it is desirable to have them slightly larger, viz., about $2\frac{3}{32}$. After the balls have been in use for some time and have been subjected to a great deal of knocking about, the ivory not only becomes seasoned, but also expands unequally; so that the balls are no longer perfect spheres. They can then be sent to the makers to be turned down, and this turning will bring the balls down to $2\frac{1}{16}$ in diameter. An excellent plan to preserve billiard balls is to bury them, when play is finished, in sawdust saturated with sweet oil. The oil seems to be taken up by the ivory, so that the balls suck up, as it were, by night what the heat of the room has caused them to lose during the evening's or day's play. Heat is a great destroyer of the accuracy of billiard balls; consequently, in India, and in other hot climates, it is a very rare occurrence to find a set of billiard balls that are true. By placing these balls in oiled sawdust when not in use, they will be preserved during a much longer time than if this precaution be not taken.

When a table has been brushed and ironed, the surface of the cloth is so glossy that during the first few strokes the "trail" of the ball can be seen on the cloth, and by bringing the eyes on the same level as the table, we can examine the track of the ball, and note whether this track be perfectly straight or slightly curved. If a ball strike a cushion at an acute angle, the fact of striking this cushion will cause the ball to take a small amount of side, and, consequently, to diverge slightly from a straight course. This slightest divergence, therefore, must not be attributed to the ball being foul. Many inexperienced players, however, never seem to become acquainted with this fact, and assert, consequently, that the balls are very untrue.

One set of billiard balls usually differs from another set, both in weight and in elasticity. The angle, therefore, at which the player's ball glances off from the ball played at will be slightly different when all the other conditions are the same. This fact causes playing on a strange table and with strange balls to be somewhat puzzling at first, as all the angles seem to come off incorrectly.

The Cue.—Each player has his fancy as regards a cue. Some like a very heavy cue, thick in the butt, and very tapering towards the point; others prefer a light one, with a broad point. Some prefer a short, others a long cue. Some writers have laid down certain laws relative to the length of the cue as compared with the player's height. All such laws are empirical. A player must choose a cue for himself by trial, and when he finds one to suit him, let him buy it, and always play with the same cue. Rules have also been laid down as to how the cue should be held; but this again is a case where each player must judge for himself. Making the "bridge" is a matter of no importance in detail, as long as this "bridge" is firm and steady. Some players spread their fingers wide apart and elevate the thumb considerably; others keep the fingers close together and elevate the thumb only slightly. Keep the important point in view, viz., that the bridge must be firm and rigid, and then try to obtain this result as best suits the form of hand. The cue should be held in such a manner with the right hand that perfect freedom is given to the arm when making the stroke. If the hand and wrist be cramped in any way by the manner in which the cue is grasped, an accurate stroke cannot be made. If the cue is held too far back, the right arm is unable to be swung freely and true strokes cannot be made. To strike a ball with the cue when it is under the cushion, the cue should be grasped about the middle with the right hand; no contortions will then be necessary to play from under the cushion. When it is necessary to shift the cue to play a stroke behind the back, the cue should be released by the right hand, and the butt passed round in front of the body, and again grasped by the right hand behind the back.

In order that the cue be used efficiently, it is necessary that the player stand firmly on his feet. The position for playing a stroke at billiards is very similar to that adopted when boxing. The left foot (if the player be right handed) should be advanced, the toe pointing towards the ball to be played at, the right foot should be drawn back, the foot turned at right angles to the line of the left foot. In this position the player can stand firmly, and when, in addition, the left hand is placed on the table, the striker's body is as it should be—rigid. To stand with the feet close together, or on one leg, causes the body to sway about and renders uncertain any stroke. The head should be raised so as to look down on the table, not lowered almost to the level of the cue. By keeping the head up a better view is obtained of the angle formed by two imaginary lines, one drawn from a pocket or ball, to the ball to be played at, the second line drawn from the ball to be played at to the striker's ball. One can test in the following manner how much more accurately one can judge an angle by looking down on it: draw on paper two lines forming an angle, then hold the paper horizontal and on a level with the eye, and it will be found difficult to estimate what the angle is; then look directly down on the paper, and you will be able to approximate very closely to the correct angle.

One of the most common causes of bad play among amateurs is that they work the right arm like a pump handle. The result of this is that the point of the cue works up and down in a corresponding manner, and consequently it becomes almost a matter of chance where they strike their own ball. They aim at a point on their own ball, probably below its centre, with the intention of making a screw. By the pump-handle movement they draw back the cue, and strike their ball, not where they had been aiming, but probably near the top, and thus give to their own ball a "follow" instead of a screw. Year after year these amateurs (and I know scores of them) will continue doing the same thing, and will assert that they cannot make a screw or twist, "it is beyond them," whereas if they merely held and worked their cues correctly, and consequently struck their own ball exactly where they aimed, they could accomplish the screw with the greatest ease.

As a matter of practice, any person may correct this elementary but serious error by securing the services of a looker-on, who ought to stand opposite the player, and tell him when his action is such as to cause the cue to move up and down. The action should then be altered, until the cue is moved backward and forward, in the same straight line.

No person can ever reach the position of even a moderately good player who does not stand firmly for his stroke, or who works his cue up and down before making his stroke. Several amateurs whom I have taken in hand and drilled as regards these two items have in consequence improved fully fifteen points in one hundred. This elementary drill was given to me when I was a mere child, and I have experienced its value in many a tough match.

The point of the cue should be chalked after every four or five strokes. To "miss cue," as it is termed—that is, for the cue to slip off the ball—is almost entirely due to carelessness in not chalking the cue; but such a "miss" loses many a game with some players.

Whenever the chance occurs, an amateur should not lose the opportunity of seeing a good professional play a match. If, however, the attention be directed only to the length of the breaks, but slight benefit will be derived from the exhibition. The manner in which the cue is held under various conditions, the form of the bridge, the method of standing for varied strokes, the way in which the rest is held, should all be matters for the keenest observation, and to be imitated and practised at leisure. Thus the very best lesson that can be received is by watching first-class professionals; but merely to look on at a game, and not to note the details to which reference has been made, is not a profitable proceeding.

The Rest.—Very few amateurs can play with either the short or long rest as ably as with the hand for a bridge. This is mainly due to the fact that, when knocking the balls about, it is seldom that practice is adopted with the rest. Considering the number of strokes during a game that have to be played with the rest, it pays to practise with it. Formerly a player might ask the marker how far the point of his cue was from his ball when he was about to make the stroke, but by the new rules the marker is not allowed to give any such information. A player, however, may leave his cue and rest in position, and may walk round the table so as to obtain this knowledge from his own observation.

When using either of the long rests, the extra weight of the long cues will cause a greater screw or twist to be given to the striker's ball than would be given if the usual cue had been used, so that a striker usually over-screws when using the long rest.

The same precautions should be used as regards using the cue by working it in a straight line, when the rest is made use of, as when the hand is employed as a bridge; and as the "pump-handle" proceeding is one of the most common causes of failure among amateurs and beginners, too much attention cannot be given to this one item.

The Game of Billiards.—"There is no such thing as an easy stroke at billiards," was a proverb that Charles Hughes had learnt from his father and uncle, both excellent players; and he impressed this on all with whom he played, and who he considered desired to know something of the science of the game. We may often see, even with some of the best players, strokes missed because they are considered so easy that no trouble is necessary. Besides accomplishing the simple stroke itself, there is something else to think about, viz., where are you going to leave the balls after the stroke? If the easy stroke is played hard, and the balls scattered all over the table, it is a matter of mere luck whether a so-called "easy stroke" is left. If, however, the stroke be played with thought and care, the balls may be placed for the next stroke, and there is nothing more interesting in the game than watching the manner in which some first-class players will make a stroke and leave the balls so that to miss each successive stroke seems almost impossible. The balls seem to be possessed of intelligence, and to travel about the table, and to stop in particular positions, as though they knew what they were about. Such skill is not obtained by practice alone; brain work is employed, and hence there is mental as also bodily exercise in a game of billiards.

It is a man of only moderate capacity who is content to knock the balls about, and is more delighted when he makes a score by a fluke than when he succeeds in making a stroke for which he played.

The style of game to be played must depend to a great extent on the player to whom you are opposed. If this player be so bad that he is likely to miss the easiest strokes, an open game may be played, and scores tried for which it is two or three to one against your making. A very bad player is as likely to score by hitting hard, and holeing the red ball off three cushions, as he is to accomplish an easy stroke.

With a very good player one must be cautious, and ought to play for few scores that are not almost certain to be achieved, or which have not strong odds in their favour. A very different style of game ought to be played when you are giving thirty points in one hundred, to that which you should adopt when receiving thirty in one hundred. A very strong player must be cramped as much as possible, by having his ball "potted," and being left with a double baulk. A rash stroke which, even if accomplished, might not leave very much, may if missed leave a first-class player a break of over one hundred.

There is a very widespread prejudice, especially amongst novices, against "potting the white," such a stroke being frequently described as "Whitechapel play"; but although it should not be too frequently resorted to when playing a friendly hundred up, owing to its tendency to unduly cramp and prolong the game, it is unquestionably perfectly justifiable and correct to do so when indicated in the course of playing a match or a heat in a tournament, it being the player's duty not only to himself, but also to his backers, to do his utmost to win by any strictly fair and legitimate means. It must be remembered that, should the player adopt this method of scoring when it is not the game to do so, it is dead against his own interest, as he leaves himself with only one object ball upon the table with which to continue his break.

No player should imagine that victory is a certainty until the marker calls "game." The opponent may make a good break, then obtain a fluke and continue the break, leave the balls safe, and make another break and win the game. Many years ago I received a lesson, as regards making too sure of the game, when playing with Cook, who was giving me forty in one hundred. The balls had broken so well for me that I had reached ninety-seven to Cook's eighteen. I had a very easy white winning hazard, and could have made a double baulk, and the game would then have stood eighteen to ninety-nine, and a double baulk left for my formidable antagonist. I, however, played for a difficult losing hazard off the red, failed to make it, and left my own ball over the pocket. Cook potted my ball, then holed the red in the middle pocket, leaving his own ball in position for the spot stroke, and won the game without my having another entry.

I remembered too late the advice that had been given me by Charles Hughes in my young days, viz., "When you have the best of the game, keep it."

When the adversary is very much ahead, and has only a short distance to travel to reach game, then it may be advisable to play for difficult strokes, provided that these, if accomplished, must leave a good break. To play, however, for a very difficult stroke which when made will leave nothing is an error of judgment.

What is called "playing the game," means playing that stroke which will leave the balls in the most favourable position for the player when the stroke has been successfully made. In this one particular nearly all young players and amateurs who have merely knocked the balls about during many years, usually fail most signally. They may be seen during a game electing to play for a stroke which it is three to one against a good player making, and which, if accomplished, would leave nothing, instead of playing for an easy stroke which must leave a good break. It is sometimes almost painful to look on at a game when such errors of judgment are shown, especially when in addition one is waiting for the table, to encounter an adversary worthy of one's steel.

There is, however, an item worthy of consideration in connection with what is called "playing the game," viz., that what may be one man's game may not be that of another. A first-class player may feel certain of accomplishing a stroke and leaving the balls in a given position; an indifferent player could not accomplish even the first stroke; consequently he should not play for it. For example, if the red ball were so situated as to enable me to play from baulk and make a losing hazard in the middle pocket, I should play for this stroke, and should endeavour to make it with such strength as to bring the red ball again over the middle pocket. If Mr. Peall found the red ball in a similar position, he would hole the red in the middle pocket, whilst his own ball would run up the table and stop exactly behind the spot, a position from which he would make fifty or one hundred red winning hazards—that is, of course, if he were not playing "spot barred."

"Playing the game," therefore, requires a correct estimate of one's own powers; for there is no more dangerous proceeding than that of attempting to play a game beyond one's power. The stroke you are most certain to succeed in making is the best game to play in the majority of cases.

It is not an unusual result to find that an amateur who has been looking on at "exhibition matches" by professionals, plays during some days afterwards a weaker game than he did before seeing the performance. The reason for this falling off is that billiards looks such an easy game when played by good players that the amateur endeavours to make the same strokes that he saw the professionals make. He is not content to play for a score which he is certain to make, but attempts strokes quite beyond him. Instead, therefore, of making a score of ten or fifteen, he breaks down at the first shot, and leaves his adversary an easy score.

The same result often follows taking lessons in the game; that is, for a short time afterwards the pupil does not score as rapidly as he did before he received his instructions. After some time, however, and when he has repeatedly practised the strokes and style he has been taught, he will make an advance of ten or fifteen points in a game of one hundred.

I have known instances where amateurs have had matches on, and a day or two before the match have gone to a professional to take lessons. The result has been that they have played their match in a style much below their usual form, they have unlearnt what little they knew, and have not sufficiently learned what they would have benefited by knowing.

When a new style has been taught to an amateur, he should practise this day after day, so as to make it, as it were, his own, before putting it in practice during a game or match.

I was fortunate enough to be present at the match for the championship between John Roberts, senr., and W. Cook, played on February 11th, 1869. I had played many games with Roberts, and had tried to imitate his dashing style. Cook I had never before seen play. The difference in the two styles was most marked. The brilliant forcing strokes of Roberts were replied to by the delicate touches of Cook, which caused the balls rarely if ever to strike more than one cushion, and then as if by reason on their part to come together. I at once recognised the fact that a new era in billiards had arrived, and that the slow, delicate play was the sure method of making a long score. Upon practising these slow strokes on a table, I found it not so easy as it looked; there was always a tendency to strike the ball too hard; and it was only after several days that I was enabled to feebly imitate the strokes I had seen played during the match. From that day I realised the important fact that the game of billiards should not be played with a cue alone, but that the head has a most important influence in the results of the score.

To strike a ball with the cue so as to give it neither side nor screw is a far more difficult performance than many amateurs imagine. To prove this fact, place a ball on the spot on the right of the baulk line, strike this ball with just sufficient strength to cause it to come back to the bottom cushion, and aim at the centre of the top cushion. The ball after striking the top cushion ought, in coming back, to pass over the spot on the left of the baulk line. If the ball be true and does not pass over the spot, it is due to the fact that "side" has unintentionally been given to the ball when it was struck. Try this stroke a dozen times, and note how often you fail to make the ball pass even within a couple of inches of the left-hand spot. When by practice you can strike your ball truly, the desired result can be obtained every time.

This stroke not only helps to make the beginner take care how he strikes the ball, but also will give him the knowledge of the angles of the table.

Again, place a ball midway between the centre spot in the baulk line and the left-hand spot, and strike the ball so that it passes over the spot in the centre of the table. If the ball be struck true, it will rebound from the top cushion, and will strike the bottom cushion close to the right-hand bottom pocket. If the ball be struck very hard, it will rebound at a slightly different angle from that at which it would rebound if struck gently; the ball in returning coming back more nearly at right angles to the cushion on which it strikes. Thus a ball struck with only sufficient force to carry it back to the bottom cushion would strike close to the pocket, whereas a ball struck very hard would strike the bottom cushion two or three inches from the pocket. It is singular how few amateur players are aware of the effect produced by the cushions on a ball that is struck very hard. The ball may rebound from the first cushion struck at nearly the correct angle, but the second and third rebound causes the ball to come back, as it were, in the opposite direction to that in which it originally rebounded. For example, place a ball about three inches out of baulk, and about six inches from the cushion. Strike this ball "true" and very hard, and play at the opposite cushion, where the baulk line touches the cushion; after three or four rebounds the ball will come out of baulk. This fact has caused some amateurs to assert that the table was bad, and the cushions foul. It is in reality due to the fact that the ball on striking a fast cushion buries itself slightly in the india-rubber, and is given "side," which causes the ball to rebound as it loses its velocity at an untrue angle.

The Cannon.—The first and easiest stroke to be made at billiards is "the cannon direct"—that is, to cause the ball struck to hit another ball, and bound off and strike the third ball. A cannon is much easier than a hazard, for the reason that, strange as the remark may appear, a ball is for such a stroke about twice the size of a pocket. The proof of this statement is as follows:—

Suppose a pocket is three inches and a quarter at the aperture. In order that the ball played with should enter this pocket, it ought not to strike either side of the pocket, but should go directly in. A ball, however, which is $2\frac{1}{16}$ inches in diameter will be struck by another ball, provided this other ball travels over the table anywhere within a ball's diameter of the second ball. Thus, suppose the two curved lines *A B*, Fig. 1, to be the sides of a pocket. The ball to enter this pocket must not strike the sides *A* or *B*. If, however, a ball were between *A* and *B*, this ball would be struck by another ball which travelled anywhere within a space indicated by three balls placed side by side thus, and these three balls cover a space nearly twice as great in extent as that occupied by the mouth of a pocket.

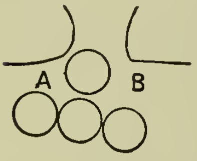

Fig. 1.

A cannon made in what may be termed a thoughtless manner is a comparatively easy stroke, but to cause the striker's ball to effect the cannon, and to strike the second ball either "full," or on the right or left side, is not by any means easy. Yet the ease or difficulty of the subsequent stroke may depend entirely on which side the second ball is struck. If the red ball be nearer the striker's ball than is the white ball, and the white ball be on the right of the red, the three balls being close together, as shown in Fig. 2, it would be easy to make a cannon. If, however, the player striking his own ball 1, caused this ball to strike 2 on the left side, he would scatter the balls and probably would not leave a second easy cannon. If, however, by playing gently he displaced the red only a few inches, and struck the other ball (2) on the *right*, the red ball *R* and the ball (2) would be left close together, and one or more easy cannons would follow. It is by such delicate and thoughtful play that several first-class players will make a series of so-called "nursery cannons," without ever moving the three balls over a greater space than could be covered by a sheet of writing-paper. Delicacy of touch is essential in making these "nursery cannons," but all the skill of the hand and cue will not result in success unless the head be also used, and the results of the stroke thought out before the cue strikes a ball.

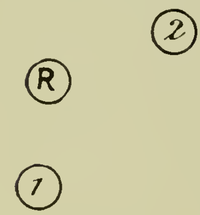

Fig. 2.

Whether to come on to the second ball on the right or left, when playing for a cannon, is one of the elementary but most essential steps towards becoming a billiard player.

There are such multitudes of cases where the manner in which the second ball is struck produces success or failure in the next stroke, that a book might be filled with diagrams on this one item. It is better for the player to practise such strokes himself, noting where he leaves the balls, according as his own ball strikes the second ball on the right or left.

The Following Cannon.—When the three balls are so nearly in a straight line as to render a fine cannon almost impossible, a "following cannon" may be easily made by striking the nearest ball almost full, and hitting your own ball near the top, so as to make it follow on after it has struck the ball played at.

The three balls shown in Fig. 3 indicate a position where a fine stroke to make a cannon would be almost impossible. 1 represents the player's ball, 2 the ball which 1 first strikes. It is required to make 1 follow on after striking 2, and to make a cannon by striking 3. To make 1 follow on, it should be struck high, and given a sort of additional rolling motion besides that given by the blow of the cue.

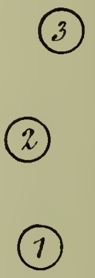

Fig. 3.

After some practice this one stroke can be made almost to a certainty, and the next advance can be made, which is to make this stroke with any required strength. Young or thoughtless players are usually so fully engrossed with making this one stroke that they do not consider where they will leave the balls after the stroke has been made. It may be advisable to play on 2 with just sufficient strength to leave this ball over a pocket; or, again, it may be necessary to strike it sufficiently hard to cause it to strike a cushion, and to return very near number 3, which may be struck only gently, by means of giving but little "follow" to your own ball. Never be content to make the one stroke only, but before playing it consider the results that will follow according as it is played gently or the reverse.

If, instead of a ball being at 3, a pocket is in the same position, a following hazard may be made in the same manner. But it must be remembered that the cannon is easier than the hazard, because the ball 3 is larger than a pocket.

A following cannon, when the balls are within a foot or so of each other, is easy, but when the third ball is four or five feet from the second, success is more uncertain, because the striker's ball as it travels may miss a distant ball, whereas it would strike this ball had it been nearer the second ball. To make this fact clear, examine Fig. 4.

Suppose 2 the ball that is first struck by the striker's ball, and that the striker's ball follows in the direction of *B*. If the third ball were at 3, a cannon would be made. If,

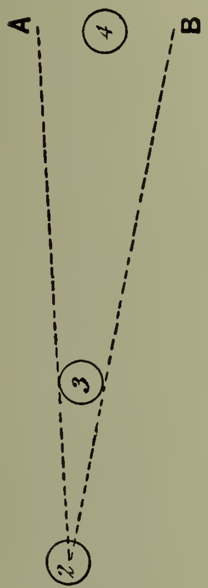

Fig. 4.

however, the third ball were at 4, this ball would not be struck, and the cannon consequently would be missed. If the striker's ball followed on in the direction of *A*, similar results would follow.

One of the most common cannons frequently missed by beginners is where there is what may be termed one short leg and one long leg—in other words, when the striker's ball, after striking the second ball, has to travel over a long distance before it reaches the third ball. As an example of this stroke, place the red ball on the spot at the top of the table, one of the white balls an inch out of the baulk. Then place your own ball in baulk, and play for the cannon by striking the white ball first. It will be found that this cannon is not made as frequently as it would be if the red ball were within a foot or so of the white ball.

It must always be remembered that a slow cannon should never be played far off the white ball on to the red, unless the striker is almost certain to accomplish the cannon. For if the cannon be missed, the two balls will be left close together, and will leave an easy stroke and probably a long break for the adversary.

Push strokes, which for many years were of great assistance to accomplished players in the compilation of large breaks, having now been declared illegal and consequently foul, no further reference to them is necessary.

The Side Stroke.—Before proceeding to describe cannons to be made off one or two cushions, it is advisable to treat of the "side" to be given to a ball.

"Side" is usually the ruin of inexperienced amateurs, who, having learnt how to give side to their ball, are so proud of the performance that they miss score after score in consequence of giving side when none is required. Before attempting the side stroke, the player should get his eye accustomed to the natural angle at which one ball will glance off from another, when the second ball is struck in a particular part, and the player strikes his own ball just above the centre, and, consequently, without giving any side to it. The effect of putting side on a ball is to alter the angle at which this ball will "come off" from the ball it strikes, so it is necessary to learn what result will follow a stroke made without side before any player can know whether any side is required to correct the natural angle at which his ball would come off the second ball. Amateurs not unusually commence at the wrong end, and begin by playing every stroke with as much side as they can put on; by this means they carefully avoid making many cannons or hazards which they could scarcely have missed had they struck their own ball fairly in the centre.

It is a very common proceeding on the part of indifferent players, when they play for a losing hazard in the top or middle pocket, and have the option of placing their own ball in any part of baulk, to select to place their own ball in such a position as to make the hazard a difficult one, and almost impossible unless a large amount of side is given to their own ball. If the ball had been placed on another part of the baulk, the hazard could have been easily made without giving any side at all.

Such erroneous proceedings are due to the fact that the player's eye has not been trained to know the angle at which his ball would come off if struck without side; consequently he is electing to play for very difficult strokes, when he could have selected very easy strokes.

The first thing to learn relative to side is the effect produced by it on the striker's ball after it has struck another ball, and the following diagram will serve to illustrate this effect (Fig. 5).

The ball 1 is the player's ball, 2 the ball at which he plays. If the ball 1 be struck "true," and the ball 2 be hit by 1 at *S*, the player's ball would run in the direction *S A*.

If the ball 1 be struck on the right-hand side, and driven with the same strength as before, and made to strike 2 at *S* as before, the ball 1 will "come off" at a greater angle, and will travel in the direction *S B*.

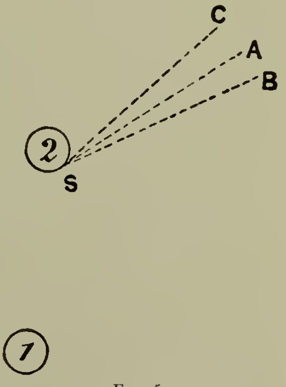

Fig. 5.

If the ball 1 be struck on the left-hand side with the same strength as before, it will, after striking 2 at *S*, travel in the direction *S C*.

Consequently, the manner in which the

ball 1 is struck enables a player to increase or to decrease the angle of the rebound without varying the strength with which he hits his own ball. This side stroke, however, should not be attempted until the player has learnt how his ball will travel when struck "true." The value of a knowledge of the results of this side stroke, when judiciously used, is very great. A cannon which without side would require the player to strike very hard to accomplish—a proceeding which would cause the balls to scatter about the table—may be made by a gentle stroke which would leave the balls close together. The effect of side is to cause the angle of rebound of the striker's ball to be increased or decreased according to the side put on. Thus, by a judicious use of this side, the second ball may be struck either on one or the other side, according to which side will leave the best break afterwards.

The effect on a ball which has a large amount of side on it when it strikes a cushion is much greater than when it strikes a ball. The ball that is struck gives way, and the full effect of the side is not felt by the striker's ball; but a cushion throws off the ball at an angle very different from that at which the ball would rebound if no side were given.

A very simple example can be obtained by placing a ball in baulk, striking the cushion out of baulk, but giving to the ball side on the baulk side; the ball, after striking the cushion out of baulk, will rebound and come into baulk. This effect of side can be made use of to make cannons off cushions, which cannons could not be made unless side were used.

Take, for example, the three balls in the relative positions shown in Fig. 6 where 1 is the striker's ball, *C C* the cushion. If the player were to hit his own ball "true," this ball would strike 2, and rebound from the cushion somewhere in the direction of *A B*. By giving to the ball 1 plenty of right side, and striking it low down, the ball 2 may be struck gently, but on its touching the cushion at *A* it will shoot off in the direction *A* 3, and make the cannon.

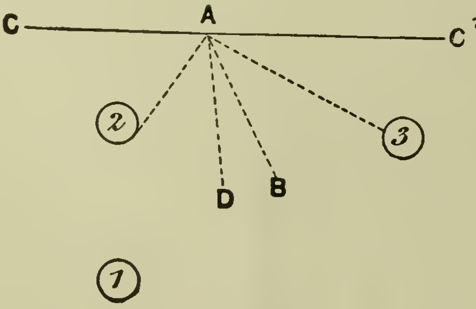

Fig. 6.

The amount of side that can be given to the striker's ball when the ball first struck is near the cushion is very great; so that when playing this stroke, care must be taken that the player's ball does not pass between the cushion and the ball 3, in consequence of too much side being given.

Cannons may be made off two cushions by the aid of the side stroke, which could not be accomplished if the player merely struck his ball "true," the two cushions being made use of when a sufficient quantity of side cannot be given to the striker's ball to make the cannon off one cushion.

Reverse side produces the opposite effect on the striker's ball to that which is caused by the last-named stroke. Thus, referring to the last diagram, if the player struck his ball (1) on the left side, and played at the ball 2 in such a manner as to cause his own ball to strike the cushion at *A*, his ball would rebound in the direction *A D*.

Thus, if the player struck his own ball "true," and caused it to strike the cushion at *A* after it had struck the ball 2, his ball would rebound in the direction *A B*, the angle *C A B* being equal to the angle *C A* 2. If "right side" is given to the striker's ball, it will rebound from *A* in the direction *A* 3. If "reverse side" is given, it will rebound in the direction *A D*.

The striker, therefore, has the power of altering the angle at which a ball will rebound from the cushion by means of the "side" he gives to his own ball when he strikes it.

The Screw.—From the side stroke to the "screw" there is only one step. To cause your own ball to screw off the ball you play at, your own ball must be struck low, below the centre, whilst the ball played at must be hit nearly full. The screw may be played with or without side. It is better first to practise the screw without side, and to accomplish this the player should strike his ball just below the centre, and if the ball at which he plays be at no great distance, he may strike his own ball with moderate strength. To learn this stroke, there is no better method, as far as I know, than to follow the instruction that I received from Charles Hughes. This was to place the red ball about the centre of the table, place your own ball in baulk, so that a line from your own ball to the red is at right angles to a line from the red ball to the centre of the middle pocket. Aim nearly full at the red ball, and strike your own ball just below the centre. Keep repeating this stroke until you find you can make a losing hazard in the middle pocket to a certainty. At the commencement of these trials many failures will occur, but these will be due either to the striker not striking his own ball just below the centre (although he usually feels confident he has done so), or to hitting the red ball either too full or too fine.

To be able to make a right-angle screw to a certainty is a very useful accomplishment at billiards, as very few games are played where once or twice in the game this stroke does not offer itself. When the ball at which you are playing is within two or three feet of your own ball, the stroke is easier than when nearly the whole length of the table separates the two balls; but the stroke can be accomplished even under the last-named condition.

If in trying this last-named stroke it is found that a right angle cannot be screwed, try the stroke by striking your own ball lower and lower below its centre. Some billiard balls are more elastic than others; this may cause your own ball to come off at a greater angle; thus by this stroke you may test the elasticity of the balls, and thereby gain a knowledge of the strength requisite to successfully accomplish various strokes.

When a right-angle screw into the middle pocket can be made to a certainty, a right-angled screw cannon is by comparison very easy, because, as has been previously remarked, a ball is twice the size of a pocket; or, in other words, it is more easy to cause your own ball to screw off the ball first struck, and then to strike the third ball, than it is to cause your own ball to enter a pocket, because the third ball offers twice the space that a pocket offers.

When a player is enabled to screw a right angle to a certainty, and with any required strength, he is on the right road to become a strong player, because he can, by a modification of the screw, make his own ball come off at slightly less than the right angle, by striking it a trifle higher than he would strike it to make a right-angled screw.

It is quite worth the trouble for any person who may be desirous of playing a strong game at billiards to practise this one stroke during half an hour or so every day for a week; he will find that being able to accomplish it will strengthen his game from ten to fifteen in one hundred.

When estimating how your own ball must be struck in order to make a cannon off one cushion, you must consider how far your own ball has to travel after it has struck the cushion before it can strike the third ball. If the third ball be near the cushion, the cannon is easier than if this third ball be far off. In either case, however, the same principle holds good, which may be popularly described as follows:—

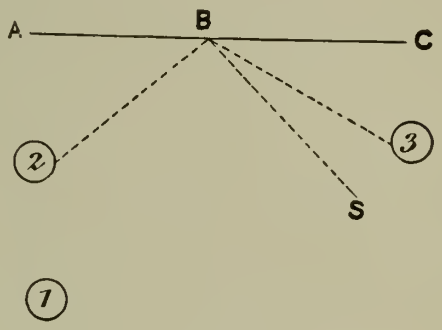

Fig. 7.

Suppose *A B C* the cushion, 1 the player's ball, 2 and 3 the other balls. Select by eye a point *B* on the cushion, at which your own ball would strike after it has struck 2. Your own ball would then rebound in the direction *B S*, the angle *C B S* being equal to the angle *A B* 2. The cannon would thus be missed; consequently, to cause your own ball to shoot off the cushion from *B* in the required direction, a small amount of right side should be given to your ball, this right side will cause your own ball after striking the cushion at *B* to come off in the direction of the ball 3. By imagining a ball to be at *B*, and then playing for an imaginary cannon on to *B*, this stroke becomes easier than if we merely played at the cushion at random.

Every variety of this cannon off one cushion may occur during a game. One ball may be just below the middle pocket on the right of the table, the other ball above the middle pocket on the left of the table, the player's ball "in hand." The player can now place his ball at any part of the "D," and play for a cannon off the top cushion, adopting the plan suggested of imagining a ball to be placed close to the top cushion, and to play for that part of the cushion where this ball is supposed to be situated, and note whether side is required to make your own ball come off at the angle required to make a cannon.

Another cannon off one cushion is of frequent occurrence in a game, especially when the adversary, considering the red ball in a safe position, "pots" the white and places his own ball in baulk. The following diagram (Fig. 8) will serve to illustrate the position of the red ball (2) and the adversary's ball (3). The player selects to place his ball in that part of the "D" from which, playing at 2, he can cannon on to the top cushion at *C* (on an imaginary ball). His ball rebounds from *C* in the direction of 3, and makes a cannon. The danger of this stroke is that if it is not played sharply, the red ball (2) will kiss the player's ball, either before or after the striker's ball hits the top cushion. There is a probability when playing this stroke of causing the red to cross over the table into the left top pocket; also, if the stroke is made too fine to make the cannon off the top cushion, this cannon may be obtained as the player's ball comes off the bottom cushion.

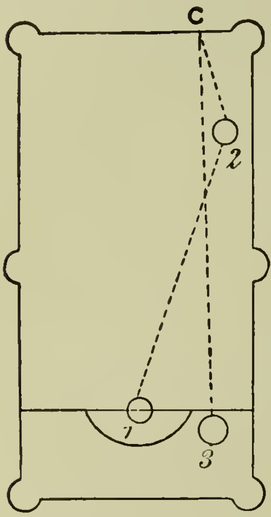

Fig. 8.

When playing a match of 500 up some years ago, my adversary, a very strong player, gave a miss in baulk, and left the balls in the position shown by 2 and 3 in the diagram; placing my own ball in the position shown by 1, the cannon was made, and the red ball was holed in the left top pocket, and a break of fifty-seven was the result. Such a break off a safety miss seemed to demoralise my opponent, who broke down afterwards when attempting comparatively easy strokes.

When attempting such strokes as the preceding, a player ought to know his own powers, and avoid playing for a stroke which he succeeds in making only about once in a dozen times. If when practising he finds he succeeds twice out of three times, it is a stroke worth playing for.

All Round Cannons.—Many amateurs are very fond of playing for "all round cannons"; that is, to make their own ball after striking the ball they aim at travel all round the table, and, perhaps, after hitting three or four cushions, make a cannon. The harder they hit their own ball, and the more they drive the balls about the table, the better they seem pleased with their performance. As a rule all round cannons do not pay; they are more often missed than they are made. If missed, they may leave a long score for a skilful adversary; if made, it is a mere chance whether the balls are left so as to render a second score almost a certainty.

Sometimes, however, all round cannons must be played for when the game is is a desperate condition; and they may be played for with advantage when the third ball is what is termed "a large ball."

"A large ball" is when this ball is in a corner of the table, and is only three or four inches from the side and bottom, or side and top, cushions. If the striker's ball can be made to travel round the table after striking the second ball, a cannon may be made by this ball striking the third ball direct or off either cushion. This cannon may be attempted when a player, giving an injudicious miss in baulk, leaves his own ball near, we will say, the right-hand pocket, and only a few inches from the right-hand side and bottom cushions. Many amateurs will then place their own ball on the right D side of the baulk, and play at the red which is on the spot; striking the red on the left side, they cause their own ball to come off from the top and side cushion and to travel into the right-hand corner; but before their own ball has reached the adversary's ball, the red has run down the table and "kissed" the adversary's ball out of the way. If, therefore, this cannon is played for, and the adversary's ball is in the right-hand bottom corner, the player should place his own ball on the left of the D, and should play on to the red with a slight amount of left-hand side; his own ball will come round the table equally as well, whilst the red ball, instead of kissing away the adversary's ball, will strike slightly below the right middle pocket, and will therefore leave the adversary's ball where it was, and a cannon will be the result.

A frequenter of a billiard room will hear day after day indifferent players complaining of their bad luck in having cannons "kissed away" from them, the real fact being that these complainers place their ball, or strike it, in such a way that it is ten to one that the cannon *is* kissed away, whereas a little more knowledge would prevent such a result.

One of the most common errors of the inexperienced player, when an easy cannon can be made, and there are perhaps two ways of making this cannon, is to select the one which will result in separating the balls, and, probably, in leaving no easy score for the next stroke. Such a case will be understood from the following diagram (Fig. 9).

The player's ball is in hand, and can therefore be placed on any part of the D in baulk; the other two balls are in the position shown by 2 and 3. If the player place his own ball on the extreme right of the D and play for the cannon, he will leave the ball 2 at the bottom of the table, whilst his own ball and 3 will, after the stroke, be at the top of the table. If, however, he place his own ball on the extreme left of the D, and play rather hard on to 2, he will cause 2 to rebound from the side cushion and to reach near the left top pocket, whilst his own ball and 3 will be up at the same corner of the table; and the three balls being near together, an easy score will be much more probable than when one ball is at the top, the other at the bottom of the table.

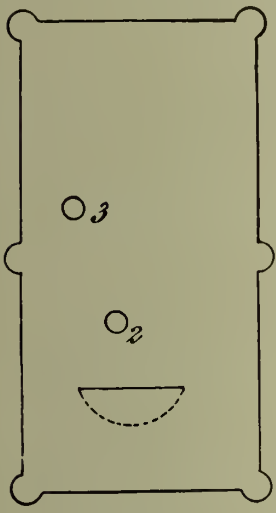

Fig. 9.

Nearly all the very large breaks now so frequently achieved by professionals in the spot-barred game are made when the three balls are at the top of the table. The reason for this is that when the red ball is "potted" it is spotted on the upper spot, and the three balls still remain close together. If the three balls were at the bottom of the table, and the red ball were "potted," it would be spotted at the opposite end of the table to that at which the other two balls were situated. When then the chance occurs, the three balls ought to be worked up to the top of the table, and then by gentle play kept together, and a long break may be the result.

A mistake which many amateurs or inexperienced players continually make is to endeavour to score five or more in one stroke; thus they will play to cannon and to put the red in a pocket by the same stroke. They seem to imagine that by scoring five at a time they advance more rapidly in the game than if they scored a cannon, and by the next stroke put the red in the pocket. It is, however, far better to make the cannon and leave the red ball over the pocket, because by the next stroke the red can be "potted," and the player can then leave his own ball in any position he chooses, either for a cannon or another winning hazard.

Again, it is very tempting, when the red ball is in front of one of the top pockets, to play for a six stroke, by following the red ball into the pocket. Before this six stroke is played for, the player should remember that he will have to place his ball in baulk for the next stroke, and a score may be very difficult; whereas if he had stopped his own ball, and not allowed it to follow the red into the pocket, he would have had a very easy score at his next stroke, and probably a long break afterwards.

As an example of such a case, suppose the adversary's ball about three inches from the upper spot, and nearly in a direct line between that spot and the centre of the baulk, the red ball close to one of the top pockets, and the player's ball just behind the red ball; a six stroke could be easily accomplished, after which the red ball would be placed on the spot and would be covered by the adversary's ball, no matter in what part of the D he placed his ball. Another score, therefore, would be uncertain. Had the player been content with merely holeing the red in the top pocket, and stopping his own ball, an easy cannon would have remained for the next stroke, and the red ball might be again placed close to one or other of the top pockets.

Many a promising break is thus marred by those who think only of the stroke that is being played, but fail to consider what will be left for the next stroke.

The Run-through Cannon.—When the red and the adversary's ball are both touching a cushion, or close to the cushion, and the striker's ball is slightly out of the production of a line joining these two balls, a cannon is very easy by means of what is termed "running through" the first ball. Thus, suppose the balls to be in the position shown in diagram (Fig. 10), 1 being the striker's ball. The player should strike his ball high, and with a considerable amount of left-hand side, or, to answer the varied positions of the balls, with considerable *cushion* side. He aims so as to strike the ball 2 nearly full. The ball 2 rebounds from the cushion, and 1 runs up the cushion and cannons on to 3.

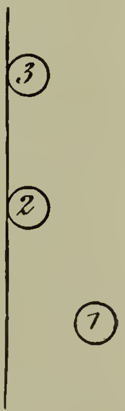

Fig. 10.

This stroke is by no means difficult; consequently it can be played with varied strength, either hard or gently, so as to leave an easy score.

THE KISS CANNON.—The balls are sometimes in a position where to the inexperienced a cannon would appear impossible, or at least extremely difficult, yet a kiss cannon can be made almost to a certainty. As an example of the kiss cannon, the following may be given (Fig. 11).

Suppose *A B C* a cushion, 1 the striker's ball, the balls 2 and 3 being in the same straight line with 1. If the player strike his own ball high, and hits the ball 2 all but full, the ball 2 strikes 3 and causes 3 to rebound from the cushion, 1 follows on, and is "kissed" by 3, and the cannon is made. This stroke may be made when the white ball covers the red, which is on the spot, and the player can place his own ball in baulk in the same straight line as the other two balls. After a little practice it will not be found a very difficult stroke, and it can be made when no other easy stroke is available.

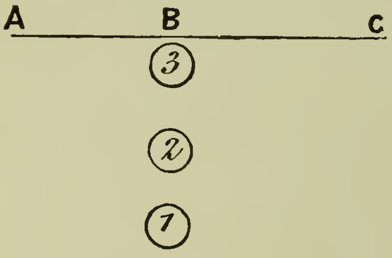

FIG. 11.

Whenever a player has learnt how to make such a stroke as the preceding, he should not be contented merely with making this stroke, but should try it with various strength, and by this experiment discover what is the best strength to employ, not only to make the stroke, but to leave a break after the score has been made.

Another form of kiss cannon, generally known as the "swing stroke," can be made by those who elect to play a dashing game, and have no cause to fear their adversary. It is, however, a very risky stroke, and never ought to be tried for when a formidable antagonist is opposed to you, unless this stroke has been practised so often as to cause the striker to know he is tolerably certain of it.

This cannon is as follows (Fig. 12):—

Suppose one ball at 2, the other at 1. The ball 2 touching the cushion, the striker's ball being at 1. The ball 1 is struck high, and with a great deal of left-hand side, the ball 2 is struck nearly full, but slightly on the right of the centre. The player's ball 1 is kissed by 2, and if the stroke be played correctly, the ball 1 will spin off 2, and will, as it were, hug the cushion and strike 3. When playing for this stroke, I have frequently just missed making the cannon, but have gone into the top pocket, and I have seen more than one professional play for and succeed in making such a hazard.

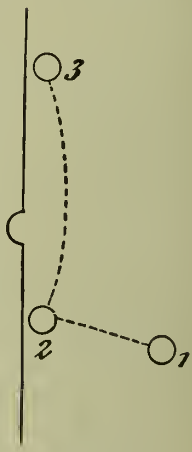

FIG. 12.

THE SCREW-BACK CANNON.—When a player has by practice become sufficiently expert to be certain that he can strike his own ball exactly where he aims, the screw-back cannon may be attempted. Before trying this stroke the cue should be well chalked, otherwise a miss cue will occur, and perhaps the cloth will be cut. The following may be given as an example of the position of the balls for a screw-back cannon (Fig. 13).

The striker's ball is 1, the ball he plays at is 2. By striking 1 very low, considerably below the centre, and slightly on the left, the player aims slightly to the left of the centre of 2. The ball 1, after striking 2, comes back and cannons on to 3.

This is a stroke which requires the greatest care, for if the player does not strike his own ball exactly where he aims, assuming that he aim at the correct part of his ball, he will either fail to bring his own ball back if he aim too high, or will miss cue and probably tear the cloth if he strike too low. This is an excellent stroke for testing whether a player can strike his ball correctly. If he finds that he can make this screw-back cannon ten or twelve times in succession, he may feel some confidence in his skill as regards striking his own ball exactly where he aims.

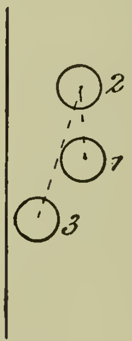

FIG. 13.

Cannons off the Red.—When an easy cannon can be made off the red ball, there is a good opportunity of placing the red after the stroke in any required position. Two examples will be given of the correct and erroneous method of playing such strokes, and from these the reader will be able to reason out how other cases might be treated.

When the red ball is below the middle pocket, the white ball near the upper cushion, and the striker's ball in hand, a cannon can be easily made, as the white ball can be placed in any part of the D. The question, however, for consideration is, how is the red ball to be struck—full, fine, or as a half ball? In selecting the position for the striker's ball, it should be noticed whether the red ball can be doubled over near to or in the middle pocket, and the white ball left near the top pocket. If this stroke can be made, a promising break may result. If the red be struck too full or too fine, it may be left much below the middle pocket, whilst the striker's ball, after the stroke, will be left at the top of the table, and neither a winning nor a losing hazard off the red will follow as an easy stroke.

When a cannon is left at the top of the table under the conditions shown in the following diagram, this cannon can be played in two ways: one way is that in which an inexperienced player will usually play it, the other is that from which the best results may be obtained. Suppose the three balls to be in the position 1, 2, 3 in the diagram (Fig. 14), 1 the striker's ball. This cannon may be made either by striking the red very fine, or by striking the red and making the cannon off the top side cushion. If, instead of attempting either of these strokes, the striker hit the red hard, and put "follow" on his ball, and make the cannon by means of a run through, he will drive the red round the table, and cause it to come back and remain near the pocket, close to which the ball 3 will be situated. This stroke would be played when the cannon off the side cushion would require that the red ball be struck hard, and the balls therefore separated. By a little practice it can be accomplished with exactly the required strength, and the three balls will be left close together, near the right-hand top pocket. Care must be taken that the red ball does not kiss the striker's ball.

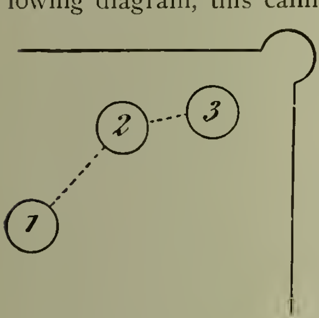

Fig. 14.

In order to obtain the delicacy of touch requisite to make a series of nursery cannons, it is an excellent plan to place the three balls in the position shown in the following diagram (Fig. 15), where 1 represents the striker's ball. A series of cannons may now be made without disturbing the positions of the balls more than a fraction of an inch. If the player strike his own ball too hard, he will make probably two or three cannons, but by delicacy of touch a dozen or more cannons can easily be accomplished. Ten minutes' practice at these strokes during each day for a week or so will be of great service to the inexperienced player, and will also aid to "steady down" the hard hitter, who usually seems to think he can score more by brute force than by skill.

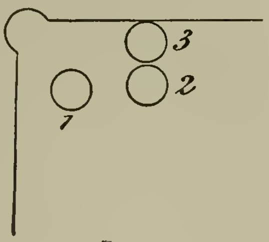

Fig. 15.

Cannons when Two Balls are in Baulk.—When a player has "potted" his adversary's ball and has made a good double baulk, so that an almost certain score can be made if the two balls remain undisturbed, the player whose turn it is to play must endeavour to do something to disturb this comfortable arrangement.

It may here be remarked that there is no stroke on the table requiring greater care and thought than that of making a *good* double baulk. To leave the red ball and your own ball within the baulk line, but in such a position that a score by the player who has made the baulk is very difficult, is no great advantage. The adversary can give a safe miss, and the game proceeds, without much advantage to the player who made the double baulk. If, however, when the double baulk is made the balls are placed so that an easy losing hazard off the red can be made by the player whose ball is in baulk, then his adversary must risk playing so as to disturb these balls. If he fail to disturb them, or if he succeeds in hitting one of the balls, he may yet fail to prevent leaving his opponent an easy score, because to strike a cushion first, and then to strike a ball in baulk, is not so very easy; but to be able to place these balls, after hitting one, is a stroke that even few, if any, professional players can be certain of.

When, however, the red and the adversary's ball are in certain positions in baulk, a cannon can be made probably twice out of three trials, and may therefore be played for even when the balls, if allowed to remain where they are, would leave no certain stroke for the next player.

In order to accomplish such a cannon, a player must make himself acquainted with the angles of the table. Now, although all billiard tables look very much alike, the cushions of different tables sometimes vary very much. Some cushions are much faster than others, and will cause a ball to rebound at a slightly different angle from that at which it would rebound from a slower cushion. Hence, to cause your own ball to strike a particular spot on the bottom cushion after it had struck the right top side cushion, then the top cushion, then the left side cushion, would require the top side cushion to be struck at slightly different points on different tables, and it would also require that the ball should be played with varied strength, according to the fastness of the table. Thus, although the exact angle and strength may be known for a table to which a player is accustomed, these may not hold good for another table. Very nearly the same results will follow, but one or two trials are requisite in order to make certain of such a stroke. The annexed diagram (Fig. 16) will illustrate how a cannon can be made when the red and the adversary's ball are in baulk, and the player is in hand. Suppose the two balls to be in the position 2 and 3. Place your own ball about two inches from the left-hand spot on the baulk line; strike your own ball high, and slightly on the left side, and aim at the right top cushion at *A*. This ball will rebound from *A* to *B*, and thence to *C*, and will either make the cannon by striking 2 then 3, or will strike the bottom cushion, and then make a cannon, striking 3 then 2.

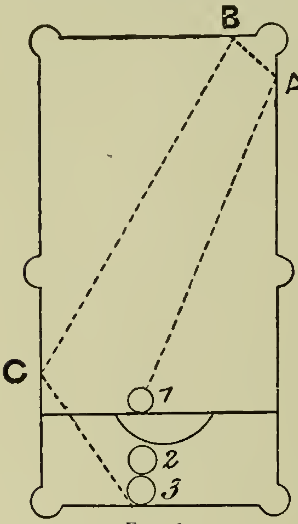

Fig. 16.

Many variations of this stroke can be accomplished, such as placing the ball on different parts of the baulk line, and striking either the right- or left-hand top cushion at different points. A player must train himself to understand these angles, and some players who have done so are specially certain of some strokes which to other players would appear merely lucky scores.

When both balls are in baulk a cannon may be made under certain conditions, if the striker is sure of the amount of side he can put on a ball, so as to cause this ball to come off the side cushion at a particular angle, when played out of baulk. Thus, if the two balls be in front of one another and in the middle of the baulk, a cannon may be made by playing out of baulk with side, the striker's ball comes off the side cushion, enters the baulk, and makes the cannon. This, again, is a stroke for which no absolute rule can be laid down. Each player ought to practise so as to know exactly where his ball will come back when played with a certain amount of side; he can then judge whether he can make the cannon off one or two cushions, and can play it with the requisite strength. It is, however, always dangerous to play a ball back into baulk if the other two balls are in baulk, unless a score is tolerably certain; more especially is this the case when no score is left for the adversary if the two balls in baulk are undisturbed, because when the third ball is played into baulk, it will most probably leave an easy cannon.

The Lace Cannon.—When the red ball is near one of the top pockets, and is covered by the adversary's ball, the position is dangerous, because, unless the red ball can be knocked away from the pocket, an easy hazard will be available for the adversary. The adversary's ball may be struck full, and caused to disturb the red; if, however, it fails to knock the red into the pocket, matters may not be mended, and a break may be left. Under these conditions, what is termed the lace stroke may be attempted. The three balls are assumed to be in the position shown in the following diagram (Fig. 17)—1, 2, 3, 1 being the striker's ball. By striking 2 on the right-hand side, and with a slight amount of left side on the striker's ball, it will, if struck hard, hit the cushion at *C*, rebound to *D*, and cannon on to 3. The term lace stroke is used because the striker's ball, in running backwards and forwards across the table, may be compared to lacing a boot. The danger of this stroke is that the striker's and adversary's balls kiss as they come off their respective cushions, but by practice the kiss may be avoided. When this cannon is well played, the three balls are almost certain to be left together at the top of the table, when consequently subsequent scores will be easy.

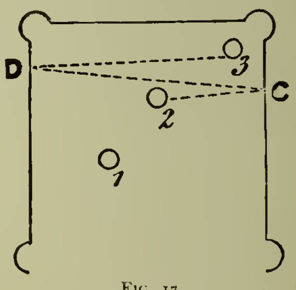

Fig. 17.

Cannons of various kinds besides those mentioned may be made, for it has been truly remarked that "there is always a cannon on the balls." Those which have been described are merely examples of various cannons, and it should always be remembered that though the cannon may be comparatively easy, a second score depends on where the balls are left after the cannon has been made. It is a common error of inexperienced amateurs to imagine that very long breaks can be made only by a series of brilliant or difficult strokes. When the play of a first-class professional is watched, the conclusion which an average player usually arrives at is that he could, without difficulty, have made every score that he saw made. The secret of long scores, consequently, is the strength with which each stroke is made, and the manner in which the second ball is struck. To play a cannon hard, and trust to chance for another score, is the sure way to bring a break to an end. Before, therefore, a cannon is played for, it is necessary to think where the balls will be left after the cannon has been made. Each game of billiards that is played, when thought is employed, is a lesson, and a player consequently improves in his game. When a score is made without reflection, no improvement in the player's game ever takes place; consequently, we may find numerous examples where men have not advanced even ten points in one hundred during more than a dozen years, though probably they may have played twenty games a week.

The Losing Hazard.—A player who is certain to make a comparatively easy losing hazard, and with judicious strength, is sure to be a formidable opponent. The red losing hazard is a most paying stroke; and I have seen more than one professional, when he had by bad luck pocketed his adversary's ball, make thirty or forty losing hazards in succession off the red, and finish this break with a safe double baulk.

In the year 1894, John Roberts, jun., made 98 consecutive red losing hazards, and on October 12th, 1906, M. Inman scored 300 points off the red ball alone.

Both these breaks, however, have been recently put completely in the shade by the simply phenomenal performance of George Gray, a lad 17½ years old at the time, who in Melbourne, on August 25th, 1909, scored 831 off the red in the course of a break of 836, thus beating the previous record spot-barred break recognised by the Billiard Association (the 802 by Stevenson in 1905), as well as pulverising the record made off the red ball alone in a spot-barred game.

Although I have seen it stated that this break was duly authenticated and made on a "standard table," I do not yet know for certain that the records made therein have been passed by the Billiard Association.

Losing hazards in the middle pocket are usually those which lead to the best results. When a loser in the middle cannot be made without bringing the red into baulk, a player has the option of three strokes: a set hazard into a top pocket, a long jenny into a top pocket, or a jenny into one of the middle pockets. Should neither of these present themselves with a probability of success, there may remain a winning hazard in the side or top pockets, played with such strength as to leave a loser in one of the top pockets for the next stroke.

To play the middle pocket hazard well requires a knowledge of "side." In order to bring the red ball into such a position as to leave another easy losing hazard in a centre pocket, the player must strike his own ball with one particular strength, and in one particular part. In order, therefore, to make the losing hazard, "side" must be used either to decrease or increase the effect of the strength with which the player strikes his own ball. It is worse than useless to play with such strength as to bring the red ball back and over the middle pocket, if the losing hazard be missed; an easy score for the adversary would be the only result. It is better to make the losing hazard with bad strength, than to obtain good strength and miss making the hazard. Now, if in order to bring the red ball back from the top cushion and over the middle, it is necessary to strike your own ball hard, so that if struck true it would hit the cushion short of the pocket, then, by hitting your own ball low, and on the side opposite to that on which the pocket you are playing for is situated, you reduce the effect of the strength, and your own ball will glance off the ball it hits, much in the same manner as though you had struck your own ball gently. If it be necessary to strike the second ball more gently, in order to bring it back to the required position, but such a gentle stroke would cause your own ball to strike the cushion *above* the pocket, then, by putting on your own ball pocket side, you increase the angle of rebound, and make a losing hazard in the middle pocket.

Speaking from long experience, I can state that whilst very many amateurs seem to be well acquainted with the effects of putting on side opposite to that of the pocket played for, few, comparatively, seem to be able to produce the reverse effect, by putting on pocket side. The consequence is that they play for a middle pocket hazard by playing hard, with the result that they make the hazard but leave the red ball in baulk; had they played the stroke more gently, and with pocket side, another middle red losing hazard would have been offered them.

When a middle pocket red hazard can be accomplished only by striking your own ball very gently, so that there is no chance of bringing the red by this stroke over the middle pocket for another middle pocket hazard, the stroke should be played with such strength as to leave the red at the upper part of the table, so that a hazard in the top pocket may be made.

When playing for a hazard in the top pocket, two disasters must, if possible, be avoided. These are very common, and prevent some amateurs from making any following score. The first is that they place their ball in baulk, and play the stroke with exactly such strength that, although they make the losing hazard, they leave the red ball in baulk. The second is that they place their ball in such a position, and play with such strength, that the red ball "catches" in one of the bottom pockets, and remains in baulk.

Such a result is almost invariably attributed by the inexperienced amateur to "bad luck." It is nothing of the kind; it is bad judgment; he has placed his ball in the wrong part of baulk, and has played with faulty strength. Not once in fifty hazards will such an event occur with a good professional player.

A third disaster not unfrequently may occur as follows:—The white ball may be in the centre of the table, the red ball at the upper end of the table. The striker places his ball in baulk, and plays hard for a losing hazard in one of the top pockets. He makes the hazard, but the red ball in coming down the table strikes the white ball, and both balls are left in baulk, with an easy hazard for the adversary unless the balls can be disturbed. To avoid such a result, a losing hazard should, if possible, be made off the white, so as to remove it from a dangerous position in the middle of the table, before the red hazard is played for; or the hazard off the red should be played for, if possible, with slow strength, so as to cause it to come only about half-way down the table. The harder the striker hits his own ball, when playing for a hazard, the more uncertain will be the position of the red ball after the stroke. Consequently, when playing from baulk for a top red hazard, when the red is near either of the top pockets, the player should strike his ball so gently that he will not bring the red much below the middle of the table.

When playing for such hazards as those last described, what is called the "drag" stroke may be used with advantage. The player hits his ball below the centre, much at the same point as if playing for a right-angled screw. Instead, however, of striking his ball a sharp blow, he should strike it more gently. The ball starts rapidly, but when about half-way up the table, the speed of the ball seems to die away, and it will strike the ball played at very gently. This stroke is more difficult to describe than it is to play; but any good player can show those desirous of learning—how a ball should be struck for the drag.

The remarks that have been made when referring to cannons, as to the effect produced on the rebound of your ball from the ball it strikes; or, in other words, the angle at which your own ball comes off the other ball when struck with side, hold good as regards losing hazards. The important fact to remember is that if you want to make your own ball come off the ball played at in the same manner as it would come off if a hard stroke were played, put on *pocket* side. If you want to reduce the angle, put on the reverse side to that on which is the pocket. Thus, by striking your own ball with the same force, two very different results will occur as regards the angle at which your own ball comes off the ball it strikes.

The practical application of this variation of side is almost endless. It comes in when playing long hazards in the top pockets when your own ball is in hand. It is of the greatest use when playing for middle pocket hazards, as it will enable the striker to make the hazard without bringing the red into baulk; because if the player struck his own ball true, he would not make the hazard unless he played with such strength that he brought the red ball into baulk.

When a player has practised making various kinds of cannons, he has merely to consider a pocket to be the third ball, and to endeavour to cannon into this pocket. Consequently, following hazards, run-through hazards, and right-angle twist hazards can be accomplished in the same manner as similar cannons can be made. It must always be remembered, however, that a hazard is more difficult than a cannon, because a pocket is smaller than a ball.

Before the "spot-stroke" was studied, and when the middle pockets were larger than they are at present, long breaks were sometimes made by a succession of jennys in the middle pockets. The player, having the option of placing his own ball in any part of the D, could select a position from which he could make the losing hazard with any required strength. This jenny, with correct strength, is one of the most difficult strokes on the balls, as the pocket taken obliquely is very small, and for the player to cause his own ball to enter the pocket requires great accuracy of eye and strength. It is more difficult to accomplish a jenny with pocket side than it is with reverse side. With the latter, the striker's ball may touch the farther side of the pocket, and the twist on his ball will cause it to run into the pocket. If this ball had pocket side on it, this side would effectually keep it out of the pocket if it struck the farther side of the pocket played for.

Long jennys in the top pockets are not so difficult as are jennys in the middle pockets; with plenty of side on the ball of the player, this side being given on the opposite side to that of the pocket, the losing hazard is often accomplished, although the player's ball strike the cushion some six or eight inches short of the top or bottom pocket. These long jennys are very paying strokes, as the ball played at will probably remain in the centre of the table, when a score after the stroke is usually offered to the striker.

One of the most difficult losing hazards on the table is what is termed a "forcing stroke"; that is, when a hazard has to be played for by the player striking his own ball hard, and without side, in order to make a hazard. To make such a stroke with any degree of certainty a player must be well acquainted with the weight of his cue and the elasticity of the balls. Unless the striker's ball enters exactly into the middle of the pocket, it will appear as though it went into the pocket and jumped out again, the fact being that, as the striker's ball travels at a great pace, it strikes one side of the cushion, then the other side, and comes off nearly at right angles to the two cushions between which is the pocket.

The striker's ball may be, as it were, "coaxed" into a pocket by "side," into which pocket it would not enter if no side were put on the striker's ball. One example of this effect has already been described in the long jenny; another effect is in a following hazard of a class that may frequently present itself in a game, and which will be understood by aid of the following diagram (Fig. 18).

Suppose 1 the striker's ball, 2 the ball played at. It is required to make a losing hazard in the pocket 3. To accomplish this hazard the player strikes his own ball high, so as to give "follow," and on the pocket side; he aims at the ball 2 so as to strike it nearly full, but slightly on the left of the centre. The player's ball follows on, and strikes the cushion just on the right of the pocket at 3, and the "side" on the ball coaxes the ball into the pocket. If the striker's ball touched the left side of the pocket, it would not enter, and the losing hazard would be missed; but the side on the ball carries it in when it strikes the right-hand side. This is not only a very pretty, but at the same time a very profitable stroke, and should be practised day after day, until a certain amount of proficiency is attained. It is a stroke that may present itself frequently during a game or match, and the accurate performance of it not only adds to one's score and probably leaves a good break, but also tends to demoralise an adversary who could not accomplish it.

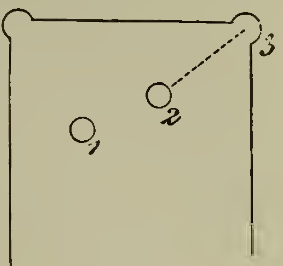

Fig. 18.

In order that a player should thoroughly understand the effect of "side" on a ball, as regards its entrance into a pocket, he may place his ball in the position shown by 1 in the last diagram and play this ball at the pocket 3, first by hitting his ball with right-hand side, and afterwards with left-hand side. He will find that if his ball strike the cushion anywhere, when he has right-hand side on, his ball will rarely if ever enter the pocket. If he strike his ball so as to give it left-hand side, it will enter the pocket after it has struck the cushion at 3—that is, on the right hand of the pocket.

One of the most paying losing hazards to make with certainty is when the striker's ball is close to one of the top pockets, the red on the spot, and the player pockets his own ball in the other top pocket. This stroke, if played with proper strength, will leave the red over the middle pocket, which pocket is on the same side of the table as is that in which the striker holed his own ball. This losing hazard may be made by striking the red half full, fine, or with a following side stroke. In either case, if the hazard be made, a subsequent score is almost a certainty.

When a player is able to accomplish the various losing hazards which have been described, he may try to acquire a knowledge of what are usually termed "fancy hazards." These "fancy hazards" are legion, and sometimes, but not often, may be made use of in a match or game. Many amateurs commit the mistake of imagining that games are won mostly in consequence of the winner being able to make some wonderful strokes. In the majority of cases it is in consequence of being able to play easy strokes with judicious strength, and to so place the balls after each score that another easy stroke is available. On looking on at the game of a good professional, there rarely if ever appears to be a difficult stroke; whereas when a fairly good amateur game is watched, every third or fourth stroke seems very difficult, but the amateur may succeed in making this, with the common result that he has nothing to play for even after he has succeeded in making it. Some few fancy or difficult losing hazards will, however, be described. They may be practised *after* the player is sufficiently skilled to make with certainty the most frequently occurring losing hazards.

EXAMPLE.—Place the red ball touching the cushion about one foot from the top or bottom pockets; place your own ball about two feet from the red ball and directly opposite to it. Thus, suppose 2 the red ball, 1 the striker's ball. Strike your own ball high and on the right-hand side; play the stroke gently, and hit the red not quite full, but slightly on the left. Your own ball will be kissed by the red, and will by this kiss enter the pocket 3. If the red ball be touching the cushion this stroke is by no means difficult. A similar losing hazard, though more difficult, may be accomplished in the middle pocket, when the red ball is either touching or nearly touching the side cushion, and the striker's ball is in front of the red ball.

It will be evident to any person that if a ball be placed at 3 (Fig. 19), a cannon can be made by this kiss stroke, even more easily than could a losing hazard. It is therefore a stroke that is worth practising; but this and other fancy strokes, such as "the massé" and "the steeplechase," should not be depended on to win a game. They may come in useful on rare occasions, but when missed are sure to leave an easy score for the adversary.

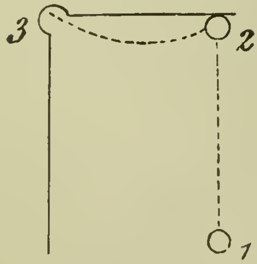

FIG. 19.

Hazards off a cushion may be defined as another form of "fancy" strokes. Cannons off one cushion are frequently played for by even moderate players, but to play for a losing hazard off one cushion is not usual; yet to make such a hazard is not so very difficult. As an example, it will be supposed that the player A at the commencement of the game gives the usual miss in baulk. The player B gives a miss, leaving his ball close to the left side cushion and about six inches below the middle pocket. The player A may now play at his adversary's ball, so that his own ball crosses the table and makes a losing hazard in the right-hand middle pocket. If the hazard be made, a good break is almost sure to follow; but if it be missed, the adversary is almost certain to have a good break offered to him. It is therefore a risky stroke, as almost all fancy strokes are, and should not be played for unless the player has practised it sufficiently often to be more certain of making than of missing it. A somewhat similar cross hazard off one cushion may be made in either the top or bottom pockets when the balls are situated as described below (Fig. 20).

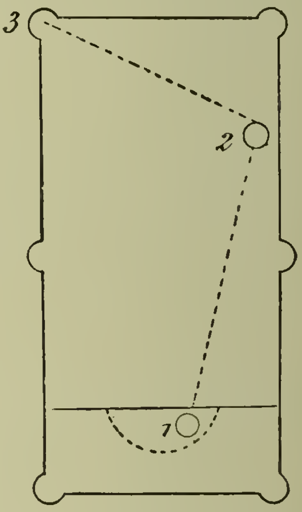

FIG. 20.

Suppose 1 the player's ball, 2 the red ball. Strike the red ball on the right. The player's ball will rebound from the right top cushion and cross over to the pocket 3. It depends on the relative positions of the balls 1 and 2 whether the player strikes his own ball with side or full and high. It is easy to make the ball 1 travel near to the pocket 3, but it requires considerable practice to make the hazard with any degree of certainty. It may, however, be practised, and if the adversary's ball happen to be very close to a cushion, so that he must be hampered for his next stroke, a liberty may be taken by playing for a fancy stroke which it would not be prudent to attempt were the adversary's ball in the middle of the table.

Losing hazards which are by no means difficult may be made by the player causing his own ball to strike a cushion before it strikes the ball off which the hazard is to be made. Many varieties of such hazards present themselves during a game, and sometimes inexperienced amateurs overlook these chances, and elect in preference to play for some difficult stroke, which they might make once in twenty times, and which if made would leave them no subsequent score.

One or two examples of such hazards are given below.

Suppose the adversary's ball to be close to the middle pocket, the player's ball in the middle of the table; of course the adversary's ball could be easily pocketed. Instead, however, of merely pocketing the adversary's ball, a losing hazard may be made in the middle pocket, and a chance of a good break may follow.

Thus, suppose 2 the adversary's ball, close beside the middle pocket, 1 the player's ball. The striker should put on left side and play at the right side of the pocket, so as to hit the cushion before his own ball strikes the ball 2. If this stroke be played gently, a losing hazard in the middle pocket is almost a certainty, and the adversary's ball will remain after the stroke at the top of the table. Many long breaks are made off this stroke, as I have found to my cost, C. Hughes once having made a break of eighty-seven off it. Before I ever thought of playing for such a hazard, I should have been content to pocket the white, and make a baulk.

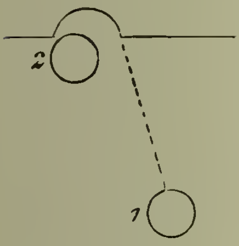

FIG. 21.

When a ball is so near a pocket that to make a losing hazard by a fine stroke, hitting the ball played at "direct," is almost impossible, this hazard may be made by hitting the cushion with your own ball before this ball strikes the ball off which the hazard is to be made.

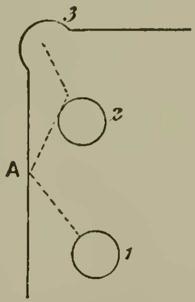

FIG. 22.

For example (Fig. 22). Suppose 1 the player's ball, 2 the ball to be played at, 3 the pocket into which it is desired to make the losing hazard. To attempt to accomplish this hazard by means of a following stroke, with side, would result in the balls 1 and 2 kissing and a score being missed. By playing to strike the cushion at *A*, the ball 1 rebounds from *A*, strikes 2 on the left and enters the pocket 3. The fact of striking the cushion at *A* produces the same effect as though the player's ball were at *A*, and he had to play for the losing hazard from this position.

It is excellent practice for an amateur, not only as regards making losing hazards, but in order to obtain a knowledge of the angles of the table, to practise the following strokes:—

Mark out in chalk on the table two circles about three inches in diameter (Fig. 23). One circle *A* should be about six inches from the top cushion, and about nine inches from the side cushion; the second circle *B* should be about one foot from *A*. Place the red ball anywhere in the circle *A*, whilst the striker's ball is placed anywhere in the circle *B*. Then endeavour to make a losing hazard, first in the pocket marked 1; replace the balls and make a second losing hazard in the pocket 2; and so on all round the table, replacing the balls in the circles *A* and *B* after each stroke. When a losing hazard in the whole six pockets can be made in from fifteen to twenty trials, the player may feel confident that he knows something about the angles of the table.

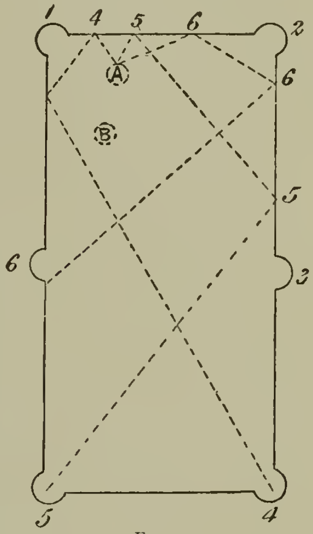

FIG. 23.

To make the losing hazard in No. 1 is very easy. No. 2 is made with a slow twist; No. 3 by striking the ball in the circle *A* very fine, and making this hazard off the top cushion; No. 4 by striking the red ball on the left, and making the hazard off the top and side cushion, as shown by the numeral 4. No. 5 is made by striking the red ball on the right, and making the hazard as shown by the numeral 5. No. 6 is made by striking the red ball nearly full, with a great deal of right-hand side, and hitting the top and right-hand top-side cushion where indicated by the numeral 6.

When the hazards are first tried, probably forty or fifty strokes will be required to make the six hazards; but with practice, which tends to steady a player, they may be made in less than twenty.

Winning Hazards.—To pocket the red ball under certain conditions is essential, and may lead to a good break. To pocket the adversary's ball and make a double baulk is a proceeding equally necessary at certain points of the game.

Before a player's eye becomes accustomed to make a winning hazard, there is no stroke so often missed. To a pool or pyramid player it is essential to make winning hazards well, and in the game of billiards pocketing the red when the adversary's ball is near the top of the table, will be almost certain to lead to a break. The theory of making winning hazards is very simple; the practice is not quite so easy.

Suppose it be required to pocket the red ball in a given pocket. Draw from the middle of the pocket an imaginary line through the centre of the red ball, where this line would come out on the near side of the red ball is the spot on which the striker's ball should hit (Fig. 24).

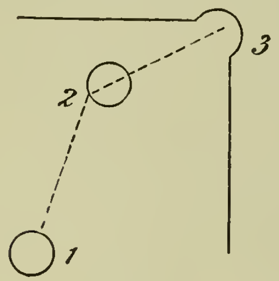

Fig. 24.

Thus, suppose 3 the pocket, 2 the red ball, and 1 the player's ball. Draw from the pocket 3 an imaginary line through the red ball 2. Then play with 1, and strike the ball 2 where this line would appear to come out of the red ball.

This principle governs the making of all winning hazards, and may serve as a guide to young players as to how such hazards must be played. It is quite possible for a person to be a very good winning hazard striker, whilst at the same time he does not in the least know how he accomplishes these, except that his eye tells him where he must hit the ball he intends to pocket. When, however, he knows the law which governs the case, he is likely to be more certain in his strokes.

If fifty diagrams were given showing how various winning hazards must be made, these diagrams if correctly drawn ought all to show the same thing, viz., that the ball that it is required to pocket must be struck by the player's ball at a point where the imaginary line drawn from the pocket through the centre of the ball would come out of that ball. This being the law, it is evident that a direct winning hazard cannot be made into a pocket when a line from the pocket to a ball makes, with a line from the ball to the striker's ball, a less angle than a right angle. As an example: a player who places his ball on the left spot of the D may be able to cut the red ball into the right top pocket when this red ball was on the top spot, but he could not cut the red into the left-hand top pocket, because the angle referred to would then be less than a right angle.

It is more difficult to make a winning than a losing hazard as a general rule. To make a winning hazard the ball must travel directly into the pocket; if it strike the cushion short of the pocket it will not drop therein, because no side can be communicated to the second ball. With a losing hazard, the striker's ball may hit the cushion short of the pocket, will "hug" the cushion, and will be carried into the pocket by the side on the ball. It requires, therefore, better sight, and a more accurate stroke, to make a winning than a losing hazard.

A winning hazard off a cushion may often present itself to a player whose eye has become accustomed to the angles. This hazard is termed a double, and may be made in the top, bottom, or middle pockets, the ball played at hitting the cushion and bounding across the table into a pocket.

The Spot Stroke.—Some twenty years ago enormous breaks were made by W. J. Peall, Fred White, and other leading professionals by the aid of the "spot stroke," the playing of which consisted of making a succession of winning red hazards into one or other of the top pockets, each hazard being so manipulated that the striker's ball was left in position to again pocket the red ball when replaced on its spot.

This stroke, requiring as it did extreme accuracy, judgment of strength, and nerve, entailed a very large amount of practice before a player could become adept at it; in fact, some of its leading exponents devoted several hours a day for years to mastering this one stroke.

As an instance of its prolific scoring efficacy when something approaching perfection was attained, I need only mention that in 1888 W. G. Peall made 633 spot hazards in succession, while about the same period he compiled two colossal breaks of 3,304 and 2,031 points, respectively, mainly by his skilful use of this stroke.

The former of these breaks was made in an exhibition match, but the latter, having been made in a match for money, when a man's nerves are naturally at extreme tension, afforded a marvellous demonstration of coolness and steadiness of eye and hand.

Of late years, however, professional players, having realised that the public were showing signs of weariness while watching the constant repetition of strokes which they considered became monotonous, have wisely agreed to play their matches spot-barred, the custom now being to place the red ball upon the spot midway between the middle pockets after two consecutive winning hazards have been made with it from its usual spot.

This limitation of the number of spot strokes allowed appears to me to be quite unnecessary when applied, as it now generally is, to amateur games, as, for reasons previously given, very few amateurs acquired sufficient proficiency to find the stroke of distinct advantage to them—in fact, in the vast majority of cases the attempt to play it proved to be a decided disadvantage.

Many chances of a useful addition to the score, had the all-round game been adhered to, were sacrificed by the attempt to gain position for the " spot stroke," with the frequent result that, when gained, very few if any hazards were successfully negotiated before the red ball was left hanging in the jaws of a top pocket, thus leaving for the opponent a certain score with which to start his innings.

Years ago I did happen to make 33 consecutive spots in the course of a hundred and thirteen break, but although pleased at the time, I subsequently came to consider the break one of the most unfortunate I ever played, as many future games were undoubtedly lost by me owing to my keen desire to repeat the performance.

Personally, unless pitted against one of the very best amateurs, I would gladly consent to my opponent playing " spot in," and the more he attempted to avail himself of my permission, the better I should be pleased.

Amongst other unusual strokes, the use of which it has been found necessary in the best interests of the game either to limit or abolish, may be mentioned the " anchor stroke," and the " cradle-cannon," by means of which latter W. Cook, in June, 1907, amassed no less than 42,746 points.

These strokes, although requiring extreme delicacy of touch and nicety of strength, were of too mechanical a nature to appeal to the ordinary billiard player, and were certainly most wearisome to watch.

What Sort of Game do I Play?—It is not uncommon for amateurs who, in consequence of living in the country, the colonies, or in India, have never seen any first-class professionals play billiards, either to overestimate their skill, or to have a very imperfect idea of what sort of game they play. Both in India and the colonies I have been told of amateurs who played billiards so splendidly that they were supposed to be nearly as good as Roberts, Cook, Peall, &c., and these amateurs seemed to hold the same belief about their play. It is desirable, therefore, that every person who plays billiards should have some means of testing his strength at the game, and thus to learn whether he is very good, good, or only moderate.

There are few proceedings more humiliating than for a player who has over-estimated his game to offer a number of points to an adversary, and then, after a few games, to discover that this adversary can easily defeat him when both start even. Every player who plays a strong game may probably have experienced many such instances; a few only will be mentioned here as examples.

To know some means by which a fair estimate of one's skill at billiards may be obtained is therefore very desirable, and many years ago I adopted a system by which any amateur can form a tolerably correct idea of his own powers. This system I called the " decimal " of a player, and this decimal is to be ascertained as follows:—

Each time a player makes his first stroke, after his adversary has played, make a mark on paper, or on a slate, and call this " an entry." If the player make any number of successive scores, do not make any additional mark, except when this player makes his first stroke after his adversary has played. The number of marks will then indicate the number of entries a player has had. In order to ascertain a player's decimal, either at the end of a game or during any part of the game, divide the player's score by the number of entries; the result will give the player's decimal. Thus, suppose a player has had ten entries, and his score is 60; then 60 divided by 10 gives 6 as the decimal. Suppose the entries have been 12, and the player's score is 50; then 50 divided by 12 gives 4.17 nearly.

Although the pockets on some tables are larger than on others, and these tables consequently are easier, and larger and more frequent scores can be made, yet this decimal will enable an amateur to form a fair estimate of his game, and it will prevent him, probably, from running away with the idea that he is a first-class player, when he is merely a very moderate performer.

As another example of this method of finding the decimal, the following is given:—

The player A gives a miss at the commencement of the game; his adversary B gives another miss. A plays for a cannon, and does not score; B makes 5, and leaves the balls safe. A plays and does not score. B makes 12; A follows and makes a break of 20. A has now had four entries, and his score is 21; his decimal, therefore, is 5.2.

Although during a game of one hundred up a fairly good amateur may make breaks of 25 or 30, yet the number of times that he fails to score reduces his decimal; and although he may imagine that he has played a very strong game, he will be surprised to find that his decimal is not more than about 4 or 5.

Having kept a record of more than one hundred matches that I have seen played, of five hundred up, I can state that the amateur who makes a decimal of over 7 is a hard man to beat. An average amateur rarely reaches a decimal of 4, unless the table is very easy, and in too many cases it is under 3.

When a player has ascertained by this system that his decimal rarely, if ever, exceeds 5, it is a delusion for him to imagine that he is a strong player, even though he be able to defeat all opponents at his club or station.

In a match played between John Roberts, jun., and W. Cook, on May 28th, 1877, Roberts scored 1,001 in 85 entries; his decimal was therefore nearly 11.8. This was, I believe, on a match table, where the pockets were very small. At Calcutta, in 1877, I saw John Roberts, jun., finish a game of 500 up in 6 entries, thus giving a decimal of about 83.3, while only the day before that upon which I write this, Stevenson, when playing in a tournament game against Diggle, scored 1,240 in 10 entries, thus having an average of 124.

If a table or the balls are not perfectly true, the better player is brought more nearly on a level with a bad or indifferent player, than when everything is perfect. If the top of a table were not exactly true, the spot stroke could not be played to perfection, and the red ball might consequently be left over the pocket by the best spot stroke player. An example of this kind occurred in my experience, in 1877, at Allahabad, in Central India, where I was a visitor. After a trial with members of the club, I was invited to be the opponent of John Roberts, jun., in a private match at the club, he giving me 650 out of 1,000 all in. In one or two private trials I had found my decimal to be about 7 or 8, but this was not good enough to give me a chance of winning if the spot stroke could be played as Roberts could play it. I found, however, that the top pockets were rather difficult, and the top of the table not quite true; so that I considered I might have a chance, however slight. Without attempting any rash or brilliant strokes, I played a safe game, and muddled on as quickly as I could, with the result that I won the match by over 100 points. In a return match at Calcutta, some months afterwards, and with the same odds, I was beaten by more than 70 points, the table at Calcutta being perfectly true, and the top pockets easier than were those of the table at Allahabad.

My decimal in both games was nearly the same, viz., slightly above 6.

The time test is not so accurate a measure of play as is the decimal. Some players are slow. An adversary may begin to chalk his cue when he should be playing; he may walk round the table and look at the balls before he plays; may stand during half a minute considering what he will try to accomplish. Consequently, the game proceeds slowly.

Then again, the winner may have the game all to himself, his opponent occupying the table during a comparatively short time.

A player who has been accustomed to play on one table, and with his own cue, finds when he plays on a strange table, and with a cue that he has never handled before, that he cannot score at his customary rate, and he may be defeated by an opponent who he feels plays an inferior game. This fact should be remembered when any person plays for the first few times on a strange table, otherwise a player may overrate his game, and commit the unpleasant mistake of giving points to an opponent who at first could not beat him when the two players started even. The converse of this fact should also be borne in mind, and care should be taken not to under-estimate the skill of a player, because during the first two or three games on a table strange to him he gives no evidence of good play.

Two examples may be given of this fact.

Many years ago, Mr. W. Cook was invited to Woolwich to play two exhibition matches—one during the afternoon, the other during the evening—at the Royal Artillery mess-room table. I was asked to be his opponent in the afternoon game, he giving me 250 out of 500, spot stroke allowed. I won the match by 170 points, and many of the lookers-on who were acquainted with the skill of Cook imagined that the result was a true representation of our respective games. I knew better, and attributed my success to the fact that the table was strange to the professional, and the game was played by daylight. In the evening Cook's opponent was a brother officer of mine, who played a slightly better game than I played, and it was imagined that Cook would again be easily defeated. A very different exhibition was now given, for although the amateur played well, and commenced with a break of over thirty, yet Cook caught him soon after he had reached three hundred, and won by more than one hundred points.

Some players appear to play a much better game than they really do play, whilst others seem to play a much worse game. Even experienced professionals sometimes make mistakes in estimating the strength of a player from mere appearances. An amateur to whom I used to give ten points in one hundred, and have the best of it, played frequently with John Roberts, sen., when his rooms were in Leicester Square. Upon my asking Roberts one day how he would handicap this player and me, he said that I ought to receive fifteen in one hundred.

Flukes.—What is termed a fluke is when a player makes a score for which he did not play.

As a rule bad players obtain more flukes during a game than a good player, and a very hard hitter is more likely to fluke than is one who plays gently. Many players seem to imagine that by hitting hard and playing for flukes they can compete with a player who thinks before he hits a ball. This is a mistake, as it is uncertainty struggling against certainty; and the sooner a player who desires to become even moderately good gives up playing for flukes, the sooner he will begin to improve in his game.

I believe it was Roberts, sen., who used to say that more might be learnt from a fluke than from an averagely easy stroke. This is undoubtedly true. When playing at pool, and endeavouring to make a winning hazard, I found that I frequently holed my own ball off a cushion, and thus lost a life, by what some players would term a fluke. After thinking over this "accident," it occurred to me that as it happened so often, the stroke might be studied and made available for billiards.

Having played for it, I found that I could accomplish the stroke, not every time, but sufficiently often to make it worth playing for in favourable circumstances, when nothing else is on the balls.

Many players are entirely put off their game when an adversary gets one or two flukes in succession; those who are so put off are not men to back in a match. A fluke should be accepted as one of the inevitables; probably before the game is over a fluke may fall to the share of the other player, and steady, careful play must tell in the long run. A player who has had a fluke or two, not unusually plays rashly, and hits hard, under the impression that his luck will continue. Many games are lost by such a proceeding, as the adversary is given chances which he would never have received had not a fluke fallen to the lot of his opponent.

When the game of an expert professional player is watched, a fluke is rarely seen, the balls are placed so carefully by each stroke that no accidents occur, and the game proceeds like a piece of machinery. It is only when an unskilled player knocks the balls about all over the table that a fluke is of frequent occurrence. Such a result, however, is to be expected; and it is well to bear in mind that the greater the number of flukes that any player obtains, the less is his skill, consequently the less likely he is to win in the long run.

Billiard Matches.—Matches of billiards vary in length according to the skill of the players. For amateurs, five hundred up is a fair test of the relative skill of the competitors; and if five hundred is scored during less than two hours, the amateur who succeeds in making this amount ought to be fairly satisfied with his performance.

To play a match of billiards either for the championship of a club, station, regiment, or when backed by outsiders, is a very different thing from merely playing a game of a hundred up for amusement. When playing a match, neither player knows who may be backing him; each should, therefore, play his very best, and he ought never to throw away a chance. In a game of five hundred up between amateurs, the luck, both in breaks and flukes, is usually about equally divided. If one player obtain luck at the commencement of the game, his opponent is almost certain to be favoured by it at the end. To play patiently, and wait one's time, is, therefore, essential. It is also essential, if the luck comes to one player in the early part of his match, that he should not be carried away by it, and begin to play for all sorts of difficult strokes, under the impression that he is so much ahead that he must win, and can therefore cut down his opponent, and beat him by any number of points; more than one match of five hundred up has been lost in this way. Each individual should play steadily and safely; a consistent game is difficult to beat. Some players who pride themselves on their brilliant play may succeed in making a dashing stroke and in obtaining a break from it. It too often happens, however, that such players will continue to play for brilliant strokes, will fail to accomplish them, and leave the adversary a long break.

It is a very common error of amateurs who have a match on hand to go, a day or so previous to their match, to some professional, and take lessons. By this means their regular game is broken up, as it were, and they have not mastered the novelties they have tried to learn.

Had they received instruction a month or so before the match, and had then, by practice, fully acquired a knowledge of those things which had been pointed out to them, their game would probably have been strengthened. I have seen amateurs who had just received instruction, miss the most easy cannon or hazard, either of which they almost invariably made, when they have attempted to make this in a way different from that which they had always previously adopted.

Another great mistake frequently made is for a man, with the idea of going into training for a billiard match or handicap, completely to alter his usual style of living shortly before the event. Should he be a smoker or a drinker, in moderation be it understood, to attempt to knock off these habits suddenly will not tend to improve his prospects of success, as in all probability he will fret and worry over the deprivation from these accustomed solaces, with the result that when the fateful time arrives for him to enter "the pit," he will do so feeling somewhat below par, and with his nerves in a more or less shattered condition.

All the precautions given for playing a good game of billiards should be remembered during a match. The excitement of the contest sometimes causes forgetfulness of elementary matters, and a player omits to chalk his cue, or he does not remember that when he has the best of a game he ought to keep it. He sometimes degenerates into bad habits, which he had when quite a young player, and stands badly, plays a stroke when imperfectly balanced on one leg, or commences working his cue on the pump-handle principle, &c.

When not actually playing his strokes, a player should sit down and obtain as much rest as possible. It is somewhat of a trial of endurance to play during two hours, and to keep one's faculties on the alert during the whole time; and a steady player, with endurance, will often defeat in a five hundred up game a player who, being more brilliant, could win three games out of four if these games were merely one hundred up, and were not played during the same day.

When looking on at the performances of a brilliant player, one is sometimes disposed to over-rate the strength of his game. He appears to make, with ease, strokes which are very difficult, and when he has an opponent possessed of only moderate skill, he may run off a game very quickly. Those who only look superficially into matters would conclude that this brilliant player could easily defeat another player whom they name. If, however, the test of the decimal be applied, it will probably be found that, in spite of his dashing play, he has made during a game of one hundred a decimal of only just over 4; and as he despised his opponent, he never gave a safety miss during the game. Any person, therefore, who knew that his average decimal was about 6.5, even when opposed to a worthy antagonist, need not fear the result if he gives even twenty-five in one hundred.

To give one hundred points in five hundred seems at first sight a very long start, but five hundred is a long journey for an amateur to travel, and if the giver of the points play steadily, and avoid getting flurried, even though his opponent at first draw even further ahead than he was at the start, he will usually find that his opponent towards the end of the game becomes nervous, especially when he finds that he is being very rapidly gained upon.

If one hundred points are given by A to B, A should bear in mind how much he ought to gain in every hundred, and he will then know that he has no cause to be alarmed about the result, if he is anywhere near the score he ought to have reached. As an example, the following may serve as a guide, A giving one hundred in five hundred:

B	A	
100	:	0
200	ought to be	125
300	”	250
400	”	375

Under such conditions the match would be very even, A having to make 125 before his adversary scores 100.

The better player is usually supposed to have the advantage in a long game; but if the handicap be fairly made, and both play a consistent game, there is no reason why such should be the case.

A series of matches is now sometimes played by professionals on what is termed the "American Handicap" principle; that is, each player plays with every other player who joins the handicap. Thus, if the players are represented by letters as follows, viz.:—

A B C D E F

A plays a game with B, C, D, E, and F. B plays with C, D, E, and F, besides the game he played with A, and so on; each player therefore plays five games, and fifteen games in all must be played when there are six players, or twenty-eight games when there are eight players, as, although most people would be inclined to say off-hand that thirty and fifty-six games were respectively necessary, sight must not be lost of the fact that when A plays B, they are *both* playing one of their five or seven games, as the case may be, at the same time. When points are given, two players receiving points start from their respective points when they play against one another. Thus, if A started from scratch, and gave B 100 points and C 200 points, then when B was opposed to C, B would start at 100, C at 200.

This system of handicap is somewhat tedious, and is certainly not so interesting to watch as is a match between two players, although it certainly has the merit of giving a player who may have been unluckily beaten in his first heat a further chance to show that, notwithstanding his initial defeat, he is on the average the best man at the points.

Whoever wins the greatest number of games in the handicap is the winner, and if the handicap be made impartially, it is, of course, very difficult to predict the winner.

The usual system in handicaps is to draw lots as to which player meets another player, and whoever is defeated in one game is out of the handicap. Thus, if six players were in a common handicap, the first three games would dispose of three players; one of the three winners would draw a bye, and would have to play the winner of the other two; therefore it would require only five games to decide as to the winner.

As one who has in my time taken part in a good many amateur matches and handicaps, upon the result of some of which the total sums wagered by spectators must have amounted to hundreds of pounds, I beg to offer to novices who are anxious to win prizes at the game a few practical hints culled from my experience.

1. Do not enter the billiard room long before the time set for your game, as the vitiated atmosphere which must pertain to a room full of gas fumes, tobacco smoke, &c., is very apt to produce a listless, lethargic feeling, whereas you want to feel as fresh and fit as possible.

2. Do not practically live in a billiard room for the last few days prior to the event, as constant practice shortly before the time is more likely to make you "stale" than to improve your performance. The time can be far more profitably spent by going to the seaside, or by taking some walks of moderate length (with a congenial companion for choice), than which there is no better exercise for brightening the eye.

3. Concentrate your attention on the game, watching every stroke of your opponent's as carefully as you would your own. Many a game has been lost through failure to notice foul strokes made by an adversary, the claiming of which would have altered the result.

4. In furtherance of this vigilance, do not enter into conversation with anyone while your opponent is playing, and try to ignore any audible remarks which may be made by spectators.

5. Carry a piece of chalk in your pocket to save having to look about for it when required.

6. Should you wish to back yourself during play, instruct some friend to arrange the transaction for you.

7. Without worrying about the score, take note of it, especially towards the end of the game: the timely giving of a safety-miss or the running of a coup may mean the different between success or failure.

8. Find out whether ivory, bonzoline, or crystallate balls are to be used in the contest, and practice only with the kind selected, as, owing to the variations in the resiliency of the different makes, a sudden change from one kind to another will hopelessly upset anyone's game.

9. Try your utmost to win, but, should success fail to reward your efforts, take your licking with a good grace, and determine to improve in the future.

How to Learn Billiards.—To play a game of which one is very fond, and which one has played during many years, and to be defeated in this game four times out of five by any opponent one meets is not satisfactory. For such a result to occur there must be some serious defect in one's play. As a general rule the individual who plays a game the most frequently becomes by practice the better player; but this is not always the case as regards billiards. We may meet men who have commenced billiards when they were young, have played all their lives, and yet before their sight or nerves failed them were beaten by very young players, who had not had even one-fourth of the experience of their elders.

Such a result must be due to some defect in the play of the older performer, and may usually be accounted for by one of the following causes:—

To holding one's cue in an incorrect manner, and when making a stroke working the arm like a pump-handle.

Playing a game without using one's intelligence, or considering where the balls will travel to after a stroke or score has been made.

Looking on at good players without observing how such hold their cue, strike their ball, or play a particular stroke.

Playing a succession of strokes in the most incorrect manner, and when told by good players how such strokes ought to have been played, ignoring such advice, and announcing that he prefers playing his own way.

It is almost painful to look on at very bad players, and to see them miss, time after time, the easiest scores in consequence of faults in their style which could so very easily be overcome, and to find that these players seem to prefer keeping to their faulty style, rather than take the trouble to practise, and try to acquire better form.

Some forty or fifty years ago it was much harder work to become a fairly good player than it is at present. In those days even the best players were not equal to even a third-rate professional of the present time, and strokes now made with ease were scarcely thought of. If John Roberts, sen., made a break of over one hundred, it was announced in the newspapers as a remarkable score, whereas in 1904 his son scored 1,392 in an innings by all-round play (although this break was not accepted as a record), and now spot-barred breaks of over five hundred are of fairly frequent occurrence.

In justice to the pioneers of the game, it is only fair to remember that a great improvement has taken place in the manufacture of billiard tables and accessories, the lower cushions especially being an enormous advantage, and that the pockets of the old "championship tables" were vastly more difficult than even those of the present-day "standard table."

To look on at first-class play is not of much benefit unless the observer watch carefully how strokes are made, and then practise these strokes until he can at least feebly imitate them. In olden times one very rarely saw what may be called first-class play unless one went to Roberts' rooms, or visited Brighton and saw Kentfield. There were certainly some amateurs whose game would even now be considered good, among these being the late Lord Eglinton, Admiral Rous, Mr. Chinnery, and others. At Pook's rooms, in St. James's Street, a club given mainly to billiards, the above-named players might be seen, and much might be learnt by watching them. Now, however, when such performers as John Roberts, jun., Stevenson, Dawson, Diggle, and others can be watched, and lessons obtained by this watching, it seems singular that so many amateurs who are sufficiently fond of billiards to play every day, are yet so feeble as rarely to score more than thirty or forty points during each quarter of an hour. The reason for such a result is mainly that such players do not exercise their powers of observation. They have acquired bad habits, and these have become chronic. They do not know that they possess these bad habits, and consequently they make no effort to eradicate these.

It is never too late to learn, and if an amateur find that his decimal is below 3 or 4, he should realise the fact that such a result is due either to the manner in which he holds his cue and strikes his ball, or to the strength with which he plays being faulty. He should then place himself under the instruction of some amateur or marker who may be sufficiently observant to have noticed the defects in style which ought to be corrected, and if the instruction be attended to, the pupil will, after a week or a fortnight's practice, be surprised at the progress he has made.

An amateur should think of the sort of strokes that he usually fails to make, but which he sees other players succeed in making nearly every time. Then he ought to inquire why it is that he fails where another succeeds. The cause of his failure will then be discovered, and he must be indeed dull who cannot, or will not, avoid such a cause. To play a game during ten or fifteen years, and not to improve in this game, is a proof that there is something very wrong; yet the average amateur, when he has reached a certain point, does not improve five points in one hundred, even though he play daily during many years.

When a player has the table to himself, and knocks the balls about for his amusement, he usually places the balls in such a position that he can make an easy score. This is a mistake; he should place them in positions where he knows from experience he rarely scores, and he should then practise strokes that he has heard of, or has seen good players succeed in making. He ought to bear in mind that the most common cause of failing in a stroke is because he does not strike his own ball where he thinks he does, and he should endeavour to overcome this error. If he strike his own ball below the centre, and the object ball nearly full, he must screw almost a right angle, if he fail to screw nearly a right angle, he ought to know that his failure to do so must be due either to his having failed to strike his own ball where he thought he did, or because he hit the other ball too full or too fine. By taking one stroke at a time, and practising this stroke for an hour, day after day, he will master it. He then will know how he makes this stroke, and will rarely be caught out of practice. A player who does not know how or why he succeeds in making a stroke will be quite unable to play up to his best form if he allows a month or so to elapse without playing a game; but this is not the case with a player who knows why he obtains certain results by striking his ball in a particular manner. Each person desirous of improving should take every opportunity of playing with an opponent who is better than himself, and endeavour by observation to learn from this superior player.

A. W. Drayson, Major-General.
W. V. Vernon-Chapman.

The Games of Pool.—Those most commonly played are "Pool" (ordinary), "Snooker Pool," "Black Pool," "Indian Pool," and "Pyramids," while other varieties, such as "Skittle Pool," "Pin Pool," "Cork Pool," &c., are occasionally met with. These latter, although amusing for a change, are not recommended to anyone anxious to excel at Billiards, as, owing to the niggling and cramped nature of the play necessary, anyone persistently indulging in them is very apt to lose that freedom of style known as "letting the arm go with the cue," which is so necessary for fine execution.

To the lover of a scientific game, a drawback common to all pool games is that they do not possess much interest unless a money stake be played for, whereas a game of billiards may be thoroughly enjoyed without any pecuniary consideration entering it.

The stakes at ordinary pool vary in different rooms and clubs, the usual proportion, however, being that the value of each "life" should be about one-third that of the pool; thus in public rooms the stake usually varies from sixpenny lives and eighteenpenny pool, to one shilling lives and three shilling pool.

Snooker and Indian Pools are generally played for some previously arranged points, the loser paying to the winner a number of pence, shillings, or whatever stake may have been agreed upon, equivalent to the number of points by which he lost the game.

The usual course at Pyramids is to have so much dependent on each ball, with perhaps an additional wager on the game.

With the exception of Indian Pool, into which cannon play enters, skill at the pool games recommended consists entirely of winning hazard striking and safety play; each man is against all others in the pool, and whilst doing all the damage he can to them, must endeavour to prevent the next player inflicting injury upon him in return. It therefore follows that, although a player may be inferior to his opponents as a hazard striker, he may, from possessing a superior knowledge of strength, and better judgment as to where to place his ball for position or for safety, prove himself to be the most successful player.

When the number of players in an ordinary pool is reduced to three, an unwritten law, conducive to good sportsmanship, is to the effect that a player, if he cannot take a life, shall endeavour so to leave the ball he plays on as to give the player following him a reasonable chance of obtaining safety in his turn.

Pool, when played among gentlemen, is a social and interesting game, but when the players are of a different class, it admits of a clique being formed, which will, by hanging together, manage to share nearly every pool. It is necessary, therefore, before entering pools in public rooms, to know something of the class of company playing; there are frequently individuals hanging about public billiard tables who live on the winnings acquired by their skill, and are not over scrupulous as regards their methods.

To play a good game of Pyramids caution is essential, and when an easy hazard is open to a player, he should well consider where he ought to leave his ball in order to secure another easy hazard.

A good hazard striker who can place his ball may be able to pocket a considerable number of balls in succession, whereas one careless stroke may cause such a break to be left for his opponent.

When more than two players take part in a game of Pyramids it is usually known as "Shell out," each player in his turn receiving from, or paying to, the other players the arranged value of a ball according to whether he, or they, make a winning hazard, a losing hazard, or a miss.

The first stroke at Pyramids is usually

played by striking the pyramid on one side with sufficient strength that the player's ball may, after cannoning on to the top cushion, come round the table and rest under the bottom cushion, without having disturbed the pyramid very much.

For purposes of reference, and as an assistance to the novice in his understanding of the different games, the latest rules of Billiards, &c., as approved by the Council of the Billiards Control Club, are appended.

RULES.

BILLIARDS, as authorised by the Council of the Billiards Control Club:—Bayly N. Akroyd, Major W. Broadfoot, Sir George Chetwynd, Bart., F. C. Coxhead, Viscount Deerhurst, W. Herbert Fowler, J. L. Godfrey, Spencer H. Gollan, the Earl de Grey, K.C.V.O., G. N. E. Hall-Say, R. S. Henderson, G. M. Hill, G. W. Hillyard, W. W. Kerr, R. H. Rimington-Wilson, the Duke of Rutland, Colin Smith, Russell D. Walker.

1.—English Billiards is played on a table with pockets at the corners and at the middle of the longer sides; three balls, plain white, spot-white, and red, are used, and the game consists of such number of points as may be agreed to by the players. The players are ordinarily two in number, but the game may be played by four persons, two being partners, or by any convenient number of players. The winner is the player or side which first scores the points agreed on.

2.—The slate bed of the table shall measure 12 ft. by 6 ft. 1½ in. The edge of the cushions shall not project over the slate more than 2 in. The height of the table from the floor to the top of the cushion rail shall be from 2 ft. 9 in. to 2 ft. 10½ in. In no case shall the top of the cushion be less than 2 ft. 9 in. from the material on which the player stands. The pockets should conform to the templates authorised by the Billiards Control Club.

A straight line drawn 29 in. from the face of the bottom cushion and parallel to it is called the Baulk Line, and the intervening space is termed the Baulk. The D is a semicircle described in baulk, with its centre at the middle of the baulk line and with a radius of 11½ in. Spots are commonly placed on the baulk line, at the intersections of the semicircle and at its centre.

The other spots marked on the table are: (*a*) The Spot, 12¾ in. from the face of the top cushion; (*b*) the Centre Spot, half-way between the middle pockets; and (*c*) the Pyramid Spot, half-way between the Centre Spot and the face of the top cushion; all three being on the centre longitudinal line of the table.

3.—The balls should be of equal size and weight; the diameter for match play may vary between $2\frac{1}{16}$ in. and $2\frac{3}{32}$ in. The set of balls may be changed during a game by consent of the players or by decision of the referee or marker.

4.—(*a*) To *string* is to play from the baulk line to the top cushion with the object of leaving player's ball as near as possible to the bottom cushion.

(*b*) A player's ball is *in hand* when it is off the table.

(*c*) A ball is *in baulk* when it rests on the baulk line or between that line and the bottom cushion.

(*d*) A ball is *forced off the table* which comes to rest otherwise than on the bed of the table or in a pocket. A white ball is in play when it has been finally placed on the table and struck with the point of the cue, and remains so until it is pocketed or forced off the table. The red ball is in play when spotted, and remains so till it is pocketed or forced off the table.

(*e*) The person about to play is termed the *striker*; his opponent is the *non-striker*.

(*f*) A *stroke* is made by a player aiming at and touching or striking his ball when it is in play with the point of his cue. It is incomplete till all three balls are at rest.

(*g*) To *break the balls* the red ball is placed on the spot and the striker plays from the D out of baulk.

(*h*) A *cannon* is made by a striker's ball coming in contact with the other two balls.

(*i*) A *winning hazard* is made when a ball other than the striker's ball is pocketed; a *losing hazard* is made when the striker's ball is pocketed, after contact with another ball.

(*j*) A *miss* is a stroke where the striker's ball fails to touch either of the other balls.

(*k*) A *foul stroke* is one made in contravention of the rules of the game. Foul strokes are defined by Rule 17.

(*l*) Two balls touching each other and each touching a side of the jaws of a pocket are said to be *jammed*.

5.—Choice of balls and order of play shall, unless mutually agreed upon, be decided by the players stringing simultaneously, the winner, whose ball is nearer the cushion, having the option. The red ball having been placed on the spot, the striker shall play from the D.

When the red ball is pocketed or forced off the table it shall be replaced on the spot; if the spot is occupied by another ball, the red shall be placed on the pyramid spot, and if that also is occupied, it shall be placed on the centre spot. PROVIDED that if the red ball is pocketed twice in succession in one break from the spot, without the conjunction of another score, it shall be placed on the centre spot, or, if that is occupied, on the pyramid spot, and should both these spots be occupied, the red shall be replaced on the spot. If again pocketed it shall be placed on the spot. Spot-stroke play may, if the players agree, be arranged for by suspending this proviso.

The players are entitled to alternate strokes unless a score is made, in which case the striker continues playing from where his ball rests or from hand, till stopped by failure. The non-striker then follows on with the other white ball.

6.—When striker's ball is in hand it shall be played out of baulk (save as hereinafter provided) from the D; when non-striker's ball is in hand it remains so till his turn to play arrives, except when spotted as a penalty under Rule 18.

7.—When striker's ball is in hand it may be played against a cushion in baulk to hit a ball which is out of baulk.

8.—If a ball is out of baulk any part of its surface may be played on if striker's ball be in hand; if a ball is in baulk no part of its surface may be played on direct from hand. In the latter case his ball must strike a cushion out of baulk before touching a ball that is in baulk.

9.—A player may not make two misses in successive innings, unless he or the opponent scores after the first miss, or a double baulk intervenes.

10.—When striker's ball remains touching another ball, red ball shall be spotted, and non-striker's ball, if on the table, shall be placed on the centre spot; striker shall play from the D; if non-striker's ball is in hand, red shall be spotted, and striker shall break the balls. When striker's ball stops so near another ball that it is doubtful whether they touch, the striker must request the referee's or marker's opinion; if there is neither referee nor marker, he must consult the non-striker before playing.

11.—A ball which has stopped on the edge of a pocket shall, if it falls in from vibration, be replaced; if it balances momentarily on the edge and falls in, it must not be replaced.

12.—If the red ball and non-striker's ball are jammed in the jaws of a pocket, red shall be placed on the spot, non-striker's ball on the centre spot, and striker shall play from the D.

13.—Consecutive ball-to-ball cannons are limited to 25; on the completion of this number the break shall only be continued by the intervention of a hazard or indirect cannon.

14.—If a ball is disturbed otherwise than by the player it shall, if moved, be placed on the table by the marker or referee on the spot which in his judgment the ball had, or, if moving, would have, occupied. This rule covers the case in which a non-striker or non-player causes the striker to touch or move a ball.

15.—The non-striker shall, when the striker is playing, avoid standing or moving in the line of sight; he should sit or stand at a fair distance from the table. He may, in case of his enforced absence from the room, depute a substitute to watch his interests and claim a foul if necessary.

16.—Points are thus scored: For a cannon or white hazard, two; for a red hazard, three. If more than one hazard, or a combination of hazards and cannon, be made by the same stroke, all are scored. Thus for a cannon and white hazard, or for two white hazards, four points are scored; for a cannon and red hazard, five points; for two red hazards, or for a cannon and two white hazards, six points; and so on, the maximum score for a single stroke being ten points.

When a losing hazard is combined with a cannon it shall be scored two or three points, according to whether the white or red ball was first struck; but if the red and opponent's ball are struck simultaneously and striker's ball enters a pocket, two points only are scored for the losing hazard. Points are also scored under Rule 18.

17.—Foul strokes are made by a player as follows:—

(*a*) By touching his ball more than once in one stroke, or after it has come in contact with another ball. The push stroke is prohibited by this clause.

(*b*) By forcing a ball off the table.

(*c*) By playing when both his feet are off the floor.

(*d*) By playing before the balls have stopped rolling, or before they have been spotted.

(*e*) By striking or touching his ball whilst in play otherwise than with the point of his cue. If a player desires to clean his ball, he may with his adversary's permission remove it for that purpose; should permission be refused he may request the marker to clean and replace his ball.

(*f*) By touching or striking a ball in play otherwise than is allowed under these rules. This covers touching a ball with the rest, and not getting the cue out of the way of a ball in motion.

(*g*) By playing with the wrong ball; the original choice of balls shall in every case determine the ownership. All points made previous to the claim of foul to be scored.

(*h*) By playing out of turn; by making more than 25 consecutive ball-to-ball cannons; by making two misses in contravention of Rule 9.

(*i*) And generally by any stroke made in contravention of these rules.

A foul stroke must be claimed before the next stroke is made, otherwise it is condoned.

18.—For a miss the non-striker shall add one to his score; if in consequence of a miss the striker's ball goes into a pocket (generally known as running a coup), or is forced off the table, the non-striker shall add three to his score. If after contact with another ball, striker's or any other ball is forced off the table, the non-striker shall add two points to his score.

For a foul stroke the striker cannot score, and his opponent plays from hand. His ball shall be placed on the centre spot, the red shall be spotted, and his opponent shall play from the D.

For refusing to continue the game when called upon by the referee or marker to do so, or for conduct which, in the opinion of the referee or marker, is wilfully or persistently unfair, a player shall lose the game.

19.—The marker shall keep and call the score, hand the rest, and attend to the players, and in the absence of a referee act as such. He shall not give advice or opinion on points affecting play.

Spectators should not interfere with the game, the players, or the marker.

20.—The duty of the referee is to decide disputes between players in accordance with these rules. He shall, on appeal, if players cannot agree, decide whether a ball is in or out of baulk. On similar appeal he shall decide whether a ball is fairly placed when about to be played from hand. He may require the striker, after having finally placed his ball, to defer his stroke to permit inspection. He is, moreover, responsible for the proper conduct of the game, and must of his own initiative intervene should he observe any breach of the rules.

In case of dispute between players, should the referee have failed to see what happened, he may take the evidence of the spectators best placed for observation and decide accordingly.

The referee shall not give advice nor express opinion on points affecting play.

The decision of the referee, or, in his absence, the marker, on questions raised under these rules shall be final.

POOL.

1.—The game of Pool is played with coloured balls, which (or small duplicate ones) are dealt out from a pool basket or bag to the players at the beginning of each game.

Cues and rests of any description may be used.

2.—The players must play in the order the colours are placed on the pool marking-board, and the first stroke of each player—excepting White—is made from the D, as also the succeeding strokes of every player when in hand.

3.—The object throughout the game is to pocket the ball played on. White is placed on the billiard spot; Red plays on White, Yellow on Red, and so on, each player playing on the last ball, unless it be in hand; in that case the player plays on the nearest ball.

4.—Each player pays into the pool the amount decided on; and starts with three lives (excepting a less number be agreed upon for any particular player).

5.—When the striker pockets a ball in accordance with these rules he is said to take a life: he must continue to play on the nearest ball until he fails to take a life, or until all the other balls are off the table. In which case his own ball is placed on the spot.

6.—The first player who loses his three lives is entitled to purchase a star by paying into the pool the same sum as at the commencement, for which he receives lives equal to the lowest number on the board. The player, however, must decide whether he will star or not before the next stroke is played. If the first player out refuse to star, the second may do so; if the second refuse, the third may do so; and so on, until only two are left in the pool; in which case the privilege ceases.

7.—If before a star two or more balls be pocketed by the same stroke, including the ball played at, each having one life, the owner of the ball first struck has the option of starring; but if he refuse, and more than one remain, the persons to whom they belong must draw lots for the star. If the balls pocketed do not include the ball played at, their owners must draw lots for the star.

8.—Only one start is allowed in a pool up to six players; two stars are allowed in a pool of seven or more players. The players taking a second star shall pay double the amount of the first.

9.—The last two players cannot star.

10.—Should a player lose a life by his own stroke, the next player plays at the nearest ball to his own; but if the next player's ball be in hand, he plays at the nearest ball to the centre spot of the D.

11.—If a doubt arise respecting the distance of balls, the distance must, if the player's ball be in hand, be measured from the centre spot of the D; but if the player's ball be not in hand, the measurement must be made from his ball to the others. If the distances be equal, then the owners of the balls must draw lots. All measurements to be made by the Referee.

12.—Baulk is no protection.

13.—A life is lost by a ball being pocketed by the striker in his proper turn; the owner of such ball paying forfeit to the striker.

14.—The striker loses a life by any one of the following means:—By pocketing his own ball; making a miss (except as in Rule 24); running a coup, or by forcing any ball off the table; by playing with a wrong ball; by playing out of his turn; by stopping or touching his own ball before it has done rolling; or by his ball striking another ball before hitting the one he ought to have played on.

15.—If the striker pocket a ball, and by the same stroke lose a life in any way, the player whose ball is pocketed does not lose a life.

16.—A player losing a life by his own stroke pays forfeit to the player whose ball he plays on or should have played on. If a player plays out of turn or with the wrong ball, he loses a life to the player who preceded him.

17.—If a player miss the ball he ought to play on and strike another ball, and pocket it, he loses a life, and his ball must be taken off the table when it has come to rest, and both balls must remain in hand until it be their owners' turn to play.

If the striker's ball miss the ball played at, he loses a life, and his ball is removed from the table, but not until his ball, or any other ball disturbed by the same stroke, shall have come to rest. If by the same stroke he pocket another ball, the owner does not lose a life. Any ball removed under this rule, and any ball pocketed, remains in hand until it is the owner's turn to play.

18.—Foul strokes are made in the following manner:—Lifting both free from the floor when striking; touching another ball in any manner whatever. The penalty is that the player cannot take a life.

If the striker, either in taking aim or in any manner whatever, except when in hand, touch his own ball, it is a foul stroke. If the striker pocket a ball by a foul stroke, the owner of that ball does not lose a life, but the ball remains in hand until it is his turn to play.

19.—If a ball or balls touch the striker's ball, or be in line between it and the ball he has to play on, so as to prevent him hitting any part of the object ball he wishes, it or they may be taken up until the stroke has been played; and after the balls have ceased running those taken up must be replaced, but a ball cannot be taken up in order to strike a ball from off a cushion, except in the case of Rule 22.

20.—If the striker's ball touch the one he has to play on he may play where he pleases, and cannot give a miss; and he may take a life by pocketing any ball, but he cannot have a ball up.

21.—If any ball or balls be in the way of a striker, or the striker's cue, so that he cannot play at his ball without a reasonable chance of making a foul, he can have them taken up.

22.—If the corner of the cushion prevent the striker from playing in a direct line at the object ball, he can have any ball removed for the purpose of playing at a cushion first, or he may have the ball moved out a few inches, but cannot then take a life. If, however, only two players be left in, the ball cannot be moved.

23.—If the striker have a ball removed, and any other than the next player's ball stop on the spot it occupied, the ball removed must remain in hand till the one on its place be played, or lawfully moved, unless it should happen to be the turn of the one removed to play before the one on its place, in which case the latter ball must give place to the one originally taken up, after which it must be replaced. If two balls were taken up from the same place the one last taken up has to be replaced first.

24.—If the striker's ball shall come to rest on the position occupied by a ball which has been taken up, and there is no other ball to play at, he shall make a miss (not running a coup) to any part of the table he pleases, for which miss he does not lose a life.

25.—If the striker have the next player's ball removed, and his ball stop on the place the other occupied, the next player must give a miss from the baulk to any part of the table he thinks proper, for which miss he does not lose a life.

26.—If the striker's ball stop on the place from which a ball has been removed, the ball which has been removed must remain in hand until the spot is unoccupied, and it is the owner's turn to play, and then be replaced.

27.—If information be required by a player as to which is his ball, or when it is his turn to play, or which ball he ought to play on, or which ball is to follow his. he has a right to an answer from the Referee. Should he be misinformed he does not lose a life; the balls must be in this case replaced, and the stroke played again.

28.—If the striker be misled as to which is his next player by a ball which is dead being wrongly marked on the board as still alive, or *vice versâ*, he does not lose a life.

29.—If the striker force another ball off the table, the owner of the ball does not lose a life, but the ball remains in hand until it is the owner's turn to play.

30.—In pools of less than four players the game is continued until all the players but one have lost all their lives (including extra lives under the star). The surviving player takes the whole pool.

In pools of four or more players, when only two players are left in with an equal number of lives, they shall divide the pool. If they have an unequal number the game is continued until the number becomes equal, when they divide, or until one loses all his lives, when the survivor takes the whole pool. Provided in all cases that a striker who has taken a ball has the option of continuing his break.

31.—All disputes must be decided by the Referee, whose decision is final. In the absence of a Referee the marker shall act as such.

32.—The charge for the play is to be taken out of the pool before it is delivered up to the winners.

SNOOKER POOL.

1.—The game of Snooker Pool may be played by two or more players, either as sides or independently.

2.—At the beginning of the game the balls are placed on the table as follows:—Fifteen red balls as for "Pyramids." Yellow on the right-hand spot of the D. Green on the left-hand spot of the D. Brown on the centre spot of the D. Blue on the middle spot of the table. Pink at the apex of the triangle touching a red ball, and afterwards on the pyramid spot. Black on the billiard spot. The white ball is in hand.

3.—Points are scored as follows:—For pocketing a red ball, one point; the yellow, two points; the green, three points; the brown, four points; the blue, five points; the pink, six points; and the black, seven points.

4.—A player must first play on a red ball, and must then play on a coloured ball. After pocketing the coloured ball, he must play on another red, and the game is continued by pocketing red and coloured balls alternately until all the red balls are taken. When all the red balls are pocketed, the coloured balls must be played on in the order of their value, the lowest first, except that the player taking the last red ball has the right to play on any coloured ball he may select for his stroke, which coloured ball, if pocketed, is spotted. But, after this stroke, any coloured ball taking its turn is dead, and cannot be spotted. This rule holds good when a coloured ball and the cue ball are pocketed by the same stroke. A coloured ball so pocketed, provided it is pocketed in its proper order, remains in the pocket, and the striker is penalised according to its value.

5.—Red balls are never replaced on the table under any circumstances, but each coloured ball is replaced on its proper spot as soon as pocketed, until, owing to all the red balls having been pocketed, the coloured balls are pocketed finally in the order of their value.

6.—When a coloured ball has been pocketed and has to be spotted, the striker is responsible that this is done, either by himself or the marker. Should he play a stroke without having the balls correctly placed on the table, such a stroke is foul, he cannot score, and the next player continues.

If the proper spot on which a coloured ball should be placed is occupied, the ball shall be placed on the nearest unoccupied spot. In the case of the brown ball the right-hand spot of the D shall be considered the nearest spot, if unoccupied. If all the spots are occupied, the ball shall be placed as near its own spot as possible, in the direction of the top cushion.

7.—Any number of red balls may be pocketed and scored in one stroke, but if a red and coloured ball or balls are pocketed in the same stroke, the striker shall forfeit the value of the highest coloured ball so pocketed.

If the striker plays on one coloured ball and pockets one or more other balls he shall forfeit the value of the highest coloured ball pocketed.

If the cue ball strikes a coloured ball when the striker should play on a red ball, he shall forfeit the value of the coloured ball first struck.

If the cue ball strikes a red ball when the striker should play on a coloured ball, he shall forfeit the value of the coloured ball played on; and, if "snookered," shall name the coloured ball he intends to hit. (A player is said to be "snookered" when no part of any ball that he is entitled to play on can be struck directly by the cue ball.) In such cases he shall forfeit the value of the ball nominated if he first strikes a red ball or a coloured ball of less value, or if such red or coloured ball be pocketed subsequent to the correct ball being first struck by the cue ball. But if he shall first strike, or pocket in any way, a coloured ball of greater value than the ball nominated, he shall forfeit the value of the ball so struck or pocketed. In all cases the striker must nominate what coloured ball he intends to play on, if requested by his opponent to do so.

In no case can a score be made by a stroke for which a penalty or forfeit is incurred, nor can the striker continue his break.

If more than one error be committed in the same stroke, the highest penalty only shall be exacted.

8.—If the striker makes a miss when he is required to hit a red ball, he forfeits one point; if when he should hit a coloured ball, the value of the ball played at.

9.—If the striker makes a miss or a foul stroke, or strikes a wrong ball, and by the same stroke "snookers" his opponent, the next player may have any ball or balls taken up to enable him to play direct on the nearest ball that is playable, and shall score any points that he makes. The balls so taken up to be replaced according to the rules of Pool.

10.—If the cue ball is pocketed the striker shall forfeit the value of whatever ball was first struck by the cue ball, unless the value of that ball is less than the one aimed at. If a coloured ball of higher value than the ball first struck is pocketed by the same stroke he shall forfeit such higher value.

11.—If a striker shall force a ball off the table he is penalised the value of that ball, and if the cue ball is forced off the table it shall be treated as if pocketed, and the striker penalised accordingly. When the cue ball is pocketed the next player continues from hand.

12.—Baulk is no protection.

13.—If the cue ball is touching a red or coloured ball when such red or coloured ball is playable, the striker cannot give a miss.

If the cue ball is touching a red or coloured ball when such red or coloured ball is not playable, the striker may play directly or off a cushion on a ball that is playable, provided he plays away from the touching ball and does not move it, and may score any points that he makes.

14.—If the striker shall strike two balls, other than two reds, simultaneously, he shall forfeit the value of the highest ball so struck.

15.—When only the black ball is left on the table, should the striker make a miss or the cue ball go into a pocket the game is at an end.

16.—All strokes or acts defined as "fouls" in the Rules of Billiards, as authorised by the Billiards Control Club, are "fouls" in this game, unless (as regards baulk being no restriction, for instance) a distinct stipulation to the contrary is included in these rules.

No scores can be allowed if a "foul" stroke is made, or if the striker behaves in a manner which renders a stroke invalid at billiards. The penalty for a "foul" is that the striker cannot score, and is liable for such further penalties as are laid down in these rules.

INDIAN POOL.

1.—The game of Indian Pool is played on a Billiard table by two or more players, either as sides or independently. It consists of winning hazards, losing hazards, and cannons. The length of the game is usually two hundred points.

2.—Five balls are employed, which are placed as follows:—Yellow ball on the right-hand spot of the D, Green ball on the left-hand spot of the D, Brown ball on the middle spot of the table, and Blue ball on the Billiard spot. The White ball is the cue ball.

The value of each coloured ball is:—Yellow three, Green five, Brown seven, and Blue nine points.

3.—The order of play is determined by stringing or in any other way agreed upon. The player who leads off must play from baulk at the Blue ball. The next player plays from where the White ball is left, at any ball he pleases, unless the White ball shall have been pocketed or forced off the table, in which case he plays from baulk at any ball that is out of baulk.

4.—Each coloured ball must be pocketed in one of its own pockets, *i.e.*, the Yellow ball or the Green ball in either of the baulk pockets, the Brown ball in either of the middle pockets, and the Blue ball in either of the top pockets. If any ball is pocketed in a wrong pocket the striker loses the value of that ball.

If a coloured ball is pocketed in one of its own pockets the striker scores its value, although he may have struck another ball first, provided he has not incurred a penalty by the same stroke.

A cannon made by the White ball striking two or more coloured balls counts two points to the striker; the White ball going in to a pocket after striking one or more coloured balls counts the value of the coloured ball first struck, provided it goes into one of the pockets belonging to that ball, but if into any of the other pockets the striker loses the value of that ball.

The striker may score all the points that he makes by any stroke.

If two coloured balls are struck simultaneously and the White ball enters a pocket the coloured ball of the lowest value shall be deemed to have been struck first.

5.—If a coloured ball has been pocketed or forced off the table, or taken up under Rule 11, it shall be placed on the spot to which it belongs, and if that spot is occupied by another ball it shall be placed on the nearest unoccupied spot. If all four spots are occupied it shall be placed on the Pyramid spot.

Only three consecutive winning hazards from the middle or Billiard spots are allowed, the ball being then placed on the Pyramid spot.

If all the spots are occupied, with the exception of the baulk spots, the left hand spot shall be deemed the nearer unoccupied spot.

6.—Baulk is a protection, *i.e.*, if the White ball is in hand the next player cannot play at any ball that is in baulk or on the baulk line.

7.—If a player gives a miss, or forces the White ball off the table without striking a coloured ball, he loses three points.

If he forces the White ball off the table or into a wrong pocket after striking one or more coloured balls he loses the value of the ball first struck.

If the White ball goes into a pocket without striking a coloured ball he loses the value of that pocket, *i.e.*, either top pocket nine points, either middle pocket seven points, the left-hand baulk pocket five points, and the right-hand baulk pocket three points.

If he forces a coloured ball off the table or into a wrong pocket he loses the value of that ball.

In all cases where a player is penalised by losing points they shall be added to his opponent's score.

The penalty for a "foul" stroke is that the striker does not score, and the next player follows on.

8.—If more than one penalty has been incurred by the same stroke the highest penalty only can be enforced. A player cannot score for any stroke by which a penalty is incurred, nor can he continue his break.

9.—All strokes or acts defined as "foul" in the rules of Billiards, as authorised by the Billiards Control Club, are "foul" in the game of Indian Pool.

10.—If the White ball is left touching a coloured ball the coloured ball is spotted, and the striker plays from baulk.

11.—If a coloured ball stops near a pocket other than a pocket to which it belongs, in such a position that any part of its surface is within one inch of the fall of the slate, it shall be taken up and placed on its proper spot.

12.—All disputes shall be decided by the Referee (or Marker), whose decision is final.

PYRAMIDS.

1.—The game of Pyramids is played with sixteen balls, viz., fifteen coloured (usually Red) and one White, and between two players or sides. Cues and rests of any description may be used.

2.—The coloured balls are placed on the table in the form of a triangle, the ball at the apex standing on the spot known as the pyramid spot. The base is placed parallel with and nearest to the top cushion.

3.—When points are given by one player to another they are at once scored, a corresponding number of balls being removed from the pyramid in the following manner, viz.:—

If one point be given, the ball is taken from the apex.
If two points, then from the corners of the base.
If three points, one from each corner of the triangle.
If more than three points, the extra balls beyond three are taken from the base.

A player can be handicapped by owing points to his adversary, but instead of taking the balls off, a number corresponding to the points owed are replaced on the table as provided in Rule 7 as soon as each one is pocketed by the conceder of points.

4. The order of play, unless otherwise agreed upon by the players, is determined by "stringing" as at Billiards. The winner of the "string" may play, or direct his opponent to do so, the player who leads off playing from the D. The next player plays from where the White ball stops, unless it has been pocketed or forced off the

table; in such case he plays from the D at any ball he chooses. After a miss the next player plays from where the White ball stopped.

5.—Baulk is no protection.

6.—Each coloured ball lawfully pocketed counts one to the striker, who continues to play till he fails to score, and he who finally scores the greater number wins the game. When the game is ended, if a player still owes a ball or balls they shall be added to the score of his opponent.

7.—If either player gives a miss, pockets the White ball, forces any ball off the table, or touches any ball before it has ceased rolling, he loses one—that is to say, a point is taken from his score, and he must place one of the coloured balls which he has pocketed on the pyramid spot; if that is occupied, the ball must be placed as near as possible behind the pyramid spot, together with any coloured ball forced off the table or unlawfully pocketed, and the opponent follows on. If he has not scored he is said to owe one, and must pay it when he is able—that is to say, the first ball he pockets must be replaced on the table.

8.—If the White ball is pocketed or forced off the table, one is deducted from the striker's score, and the next player is in hand, and plays from the D.

9.—Foul strokes are made as follows:—

> Playing before all the balls are at rest.
> Playing before a ball is replaced on the table when required by the rules.
> Playing with both feet off the ground.
> Touching or moving in any way the White or any coloured ball, or in taking aim, or before all the balls have ceased rolling.
> By touching the ball more than once in one stroke, or after it has come in contact with another ball. The push stroke is prohibited by this clause.

10.—The penalty for making a foul is that any score made by such stroke does not count, and the opponent follows on; and should any Red ball or balls have been pocketed by the stroke, they must be replaced on the table according to Rule 7.

11.—Notwithstanding that the White ball touches a coloured one, the striker may score all the coloured balls he pockets, or he may play for safety; but if he touches the White ball in any way after it has struck a ball, the stroke is foul, as in Rule 10. When the White ball touches another ball the striker cannot give a miss.

12.—When all the coloured balls but one are pocketed, the player who made the last score continues to play with the White, and the opponent uses the coloured ball. When these two balls are left on the table, should the striker pocket the ball he is playing with, make a miss, or force it off the table, the game is finished, the opponent adding one to his score. Should, however, the striker make a foul stroke and also pocket his opponent's ball, the stroke does not count, and the opponent plays from the D at the striker's ball, wherever it has been left on the table.

13.—No player is allowed to receive, nor any bystander to offer, advice on the game, but should any person in the case of dispute be appealed to by both players, he has a right to offer an opinion; or if a spectator sees a game wrongly marked he may state the fact, but he must do so prior to another stroke being made.

14.—For refusing to continue the game when called upon by the Referee to do so, or for conduct which, in the opinion of the Referee or Marker, is wilfully or persistently unfair, a player shall lose the game, and Red balls remaining on the table shall be added to the opponent's score.

15.—All disputes must be decided by the Referee, whose decision is final. In the absence of a referee the Marker shall act as such.

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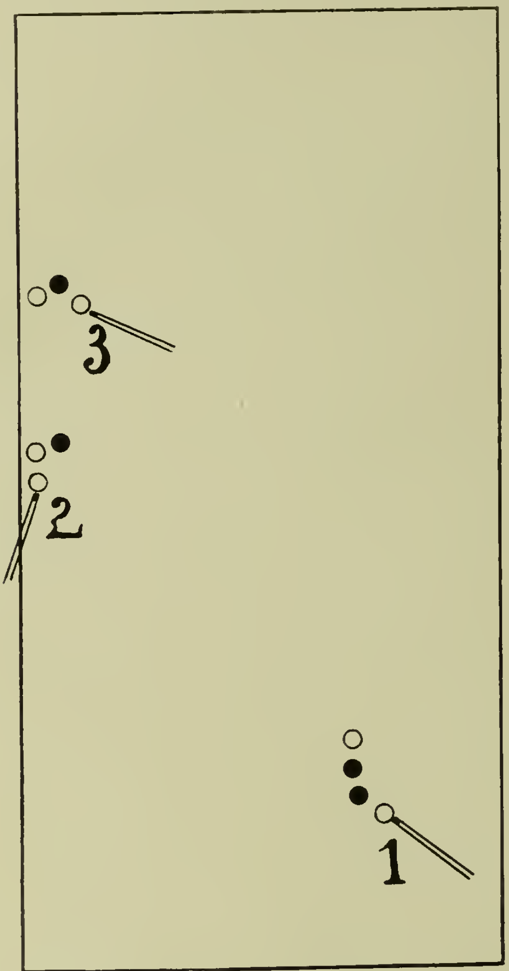
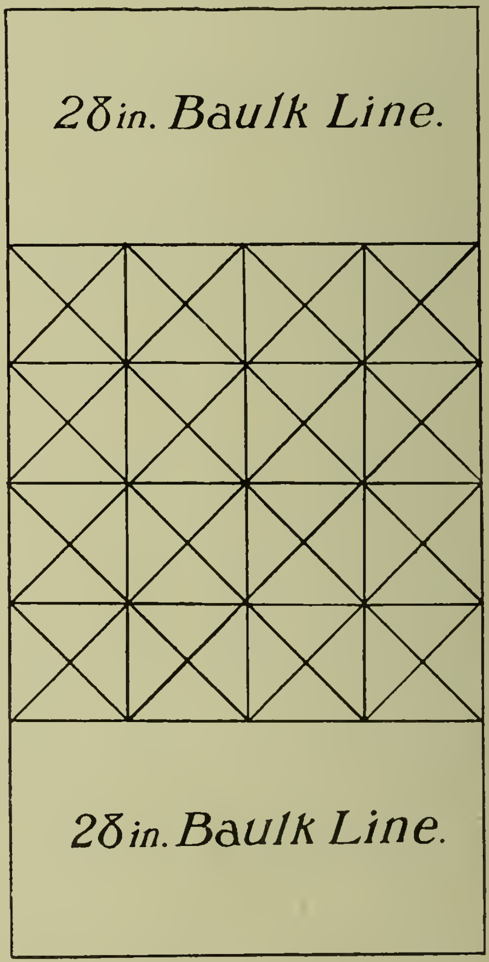
THE GAME OF FRENCH BILLIARDS.—It may come as a surprise to many, only knowing the French style of billiards, or *carombolage,* as played on pocketless tables with balls of large dimensions and ponderous cues, to learn that this is, comparatively, a recent innovation. In its earlier phases the game of French billiards was identical with the English or six-pocket table of the eighteenth and beginning of the nineteenth century. As a matter of fact, a Frenchman, one Capitaine Mingaud, an officer in Napoleon's *Grande Armée,* gave the play its first recognised principles by the successful experiments he made upon a six-pocket table. However, with the majority of the French players becoming ardent students of the strict-cannon class of stroke, and being, moreover, convinced of its forming the basis of all the best that the game of billiards holds, it was resolved, almost with one accord, to put a veto on the pockets, and straightway the plain cannon table was evolved and spread all over the Continent, and, incidentally, America. One-half of the world plays this French cannon game, leaving the other half, as comprised by the British and subject races in Australasia, New Zealand, South Africa, India, and Great Britain, to the so-called English or compromise cannon and pocket game.

The strict-cannon table, if of less scope than our players are accustomed to, the usual size being 9 ft. by 4½ ft., and the championship table 10 ft. by 5 ft., still holds its problems. Its chief experts, wedded to the task of scoring as great a series of cannon shots as their abilities will permit, have not mastered all the possibilities. But whereas the English pocket table has barely had cause for the legislative hand to tamper with its divisions and markings, the French cannon table has suffered many changes during its eighty or ninety years' existence. These changes have, however, been of quite recent date. The cause was the extraordinary proficiency to which the French and American professionals attained once the secret of the plain runs of close-cannons, known by the name of *caroms*, was disclosed as the outcome of unceasing and earnest attention by the great players, and foremost among them all Maurice Vignaux, the French *maître de billards.*



1. The Old-fashioned Four-ball Game.
2. The Position of the Rail-nurse.
3. The Ensuing Position, showing the in-and-out motion of the Cue-ball.

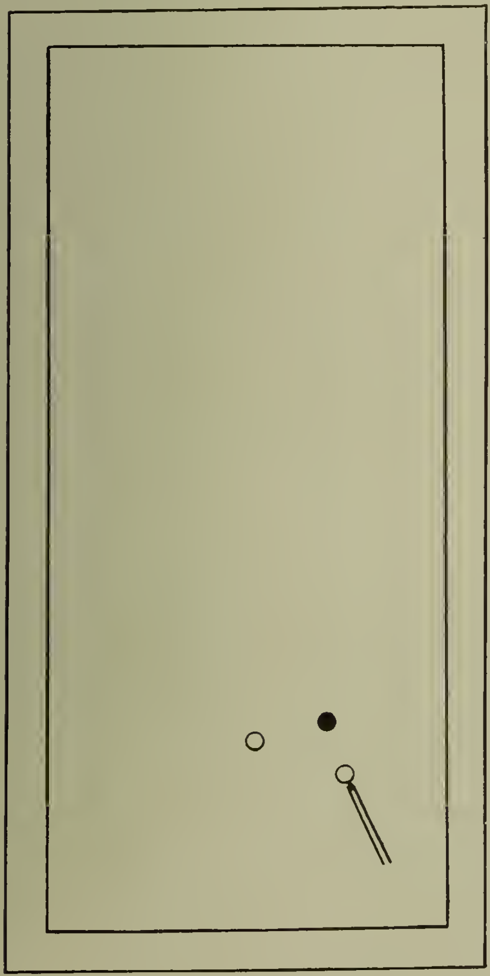
Gradually, the system of cannons, carrying the balls around the table by the cushions with the cue-ball, delicately struck shot by shot, steering the two objects, held in all but complete subjection, ahead of it, began to be very clearly appreciated. The technique of the play and the recurring positions and their manifold variations, began to be grasped by the foremost exponents. Where fifty successive cannons had once been regarded as an unparalleled achievement, the runs surely assumed greater proportions. They grew year after year by the hundred, until at length so nearly had the human machines arrived at a stage of perfection that, by common consent, it was acknowledged that the secret of the cannon-table was out and given forth to the world at large. Cannons were at a discount, and it was apparent a method of retarding, if not of actually negativing, the "straight-rail" or



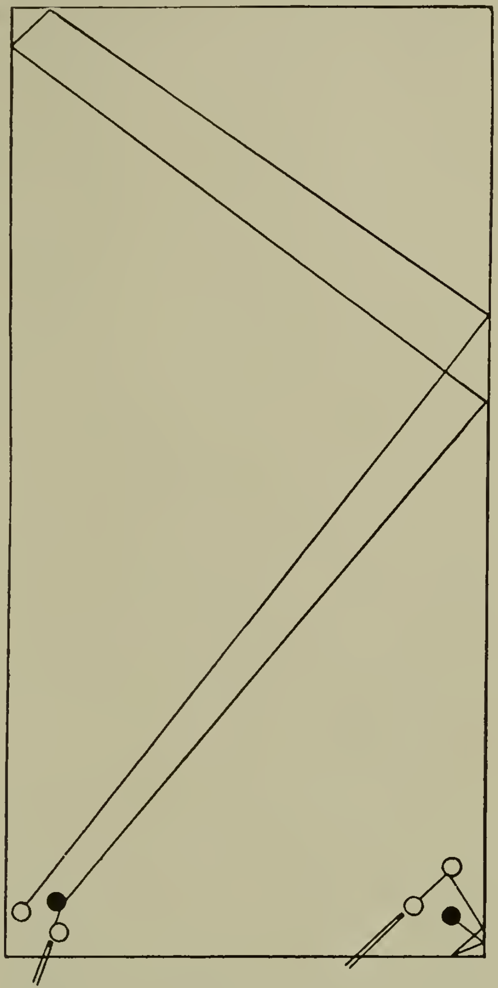
A Design to drive Play to the Middle of the Table. One Cannon is allowed in each Section.

cannons along the cushions would have to be devised to prevent the strict-cannon table from suffering from a surfeit such as threatened its compeer, the English pocket table, at the unexpected appearance of the celebrated "cradle-cannon" shot a few years back.

First of all, the four corners of the board were lined off so that only one cannon could be scored within the prescribed bounds. Then, as the "straight-rail" play was not seriously interfered with, a further limitation, that of allowing only one object-ball within the compartment and for but a single stroke, was next resorted to. But, after a time, the ingenuity of the players was such as to enable them to avoid these partitions entirely. By dexterous manipulation, the balls were turned around and past the corners, and the series of cannons resumed with the utmost facility along the straight sides and ends. What was described as a "champion's box" or triangular-shaped lines drawn at the centres of the four cushions marked the next step in the attempt to curtail the still increasing number and ease of the cannons. For a few months these did act as impediments. But the resource of the French billiard artists was not long in showing them a way round, and the desired object was no nearer being achieved than at any time before. At length, after many consultations between the French and American billiard leaders, the principle of baulk-lines drawn all round the table was inaugurated. It proved to be the salvation of the strict-cannon game, and to provide a form of play which was at once attractive yet bristling with difficulties. In its initial stages the two things seemed less likely to fit in with one another. But experience proved that these baulk-lines could open up a new and most diverting



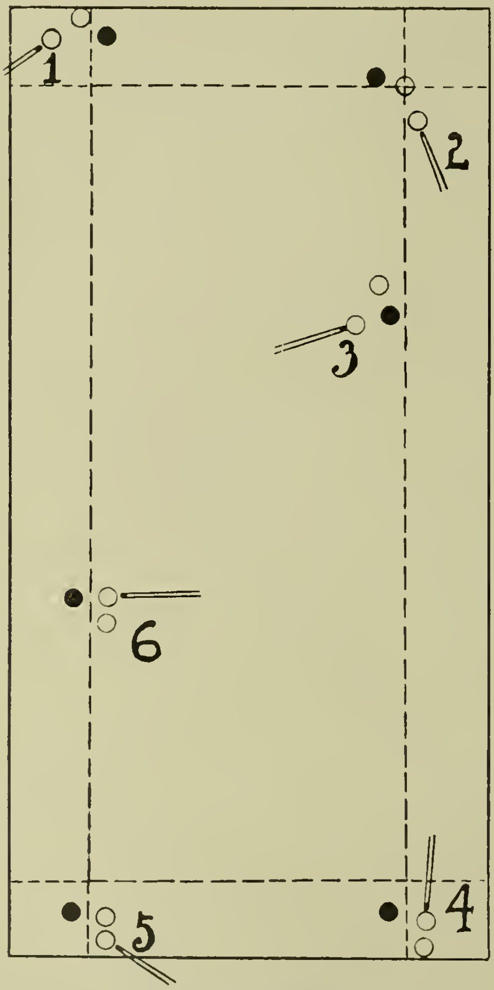
A 6-inch Baulk-Line, wherein two successive Cannons are illegal.



Examples of the Long and Short Movements at Three-cushion Cannons.

set of propositions to the most skilful cueists.

At its inception the baulk-line was set six inches away from the cushions. But the genius of Vignaux and Slosson overcame the obstacles thus placed in their path, and the toll of cannons, for a period reduced to the desired grade, again began to realise unexpected proportions. The idea of the baulk-line was to prohibit two successive cannons being scored inside the line. This ruling made a very revolutionary movement in the play. The question was how to devise a reliable method of maintaining a hold over the balls for a more or less simple series of shots. It was not readily answered. Day by day, though, a theory was being established and proven sound in practice. This took the form of giving the first-played object-ball more movement than it had before received in the process of a run of cannons. The cue-ball was so tended as to leave little life in it when cannoning upon the second object-ball, so that these two balls practically awaited the return of the first-played object-ball from the cushion. Once the theory was fully analysed and approved, the rest became comparatively simple to the master executants. The extra distance that they were called upon to operate from the real base—the cushion-line—did not present great difficulties, and soon the cry went up that the chief professionals were again scoring too fast and too long. So it came about that the baulk-lines were extended, first to nine inches, to twelve inches, to fifteen inches, to eighteen inches, and then to twenty inches, without the best billiard hands being seriously incommoded by these recurring and increasing shapings.



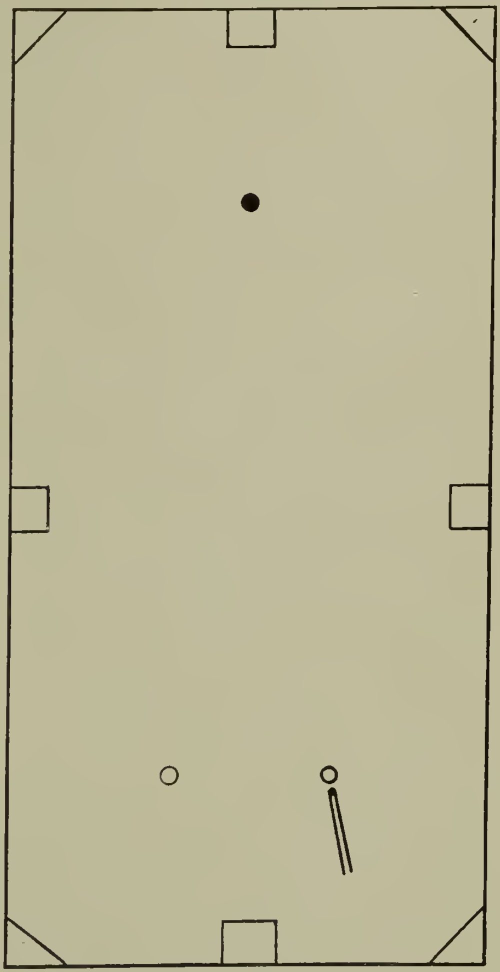
Famous Baulk-Line Positions.

1. The "anchor" nurse.
2. The intersecting line nurse.
3. Wide nurse.
4. "Chuck" nurse out of anchor and out of baulk.
5. À Cheval.
6. "Line" merac.

In billiards, legislation has always been set to the demands of the most expert, no matter the backwardness of the general run of amateurs and the proof of existing conditions being sufficiently formidable for their inferior capacity. It is so in England, which leads the way in the English game, and it was so in France when the unrestricted cannon play was so carefully guarded against in the matter of the baulk-lines. Thus, no little wisdom was shown by the councillors (mainly Americans, by the way), who, at the various meetings, attended to the revision and amendment of the French billiards code of rules, in mapping out what is to all intents and purposes a set of distinct games. There is (1) the plain-cannon game set with no restrictions whatsoever; (2) the corners lined off and the push-stroke barred; (3) the baulk-line game, varying, according to the fancy of the players, from six to twenty inches, each and all separate and distinct. The most popular of the set is still the first or quite primitive form, with the advancing steps keeping pace with the quality of the players' requirements. If the golden age of French billiards has passed, there are yet upwards of 90,000 of the pocketless tables, which are its medium, subject to the annual taxation imposed by the French Government upon their owners and lessees. Every *café* worthy the name finds room for the oblong board of varying size between 8 and 10 feet in length and proportionate width.

French billiards, or the *jeu de carambolage*, to give it its proper title, was formerly a four-ball game. This had but a fleeting career, however. The universal three-ball game was soon adopted, and quickly found popular favour. The size and weight of the balls, which are, usually, $2\frac{1}{4}$ to $2\frac{3}{8}$ inches in diameter, need equivalent driving power in the shape of the cues. These are anything from 18 to 24 oz. in weight, and are made from the toughest and most elastic of woods. The cloth is much more strongly "napped" and heavier than that used on the bigger English tables, and the best specimens are manufactured in Belgium. Neither the cloth nor the cushions have the same keenness as our own—a fact to be attributed to the added impetus of the heavier and larger balls, whose movements need to be kept under restraint, while at the same time permitting every variety of stroke to be rendered possible and a reasonable freedom of running.

To commence every type of game of billiards known to the French table, the red ball is placed upon a spot at the head of the table, and the two whites occupy parallel positions at standard points marked within the lower half. The opening stroke must be played from the red ball. One may play safety, but there is little latitude for defensive shots, and the better policy is to go out for a cannon, unless some very exceptional position is met with, leaving the run of the balls to their own tender mercies. The whole aim of the player is to gather the three balls together and retain them under control in a greater or lesser chain of cannons. To the expert operators the " rail-nurse " or runs of cannons driving the balls along by the cushions, as is to be seen on English tables, is little more than child's play. Their deft treatment of the balls and their mastery over the curling *massé* strokes must be seen to be fully appreciated. It is true that the baulk-lines, in increasing proportion to the distances these are marked from the face of the cushions, impose a very much more difficult question, and reduce break-making to more modest limits than the infinite possibilities afforded by an unrestricted board. Withal, the secrets once tenaciously held by the pocketless have been remorselessly laid bare by its most profound students. Not even the super-imposed difficulty of having to play from the further object-ball or from a cushion when the cue-ball lies touching an object-ball has checked the heavy scoring of the more skilful among the army of French billiardists, whose attainments have urged them to indulge in higher flights of skill. As an off-shoot of billiards proper, the three-cushion-cannon game, or *caroms-à-trois-bancs*, has enjoyed a tremendous vogue both on the Continent and in America. The cue-ball has to strike three or more cushions before it can legitimately cannon upon the second object-ball, and it is immaterial whether the cushions are struck before or subsequent to the understood contact with the first object-ball. This attractive game brings out the merit of the pocketless game in the most pronounced fashion imaginable, the truly remarkable and endless variations it permits of providing an attractiveness which has proved irresistible to the *carambolage* enthusiasts.


THE TABLE CORNERED OFF AND SET WITH BOXES AT THE CENTRES OF THE CUSHIONS TO LIMIT THE RUNS OF CANNONS.

Attempts have been made to shape a compromise table which shall, while building a half-way house between the French and English styles of billiards, leave untouched the salient features of either. So far, however, they have not been attended with success. The most frequently tried was the playing of a strict-cannon game upon a six-pocket table with large-sized balls, and the "jawing" or "jamming" of the balls in the mouth of the pockets debarred. Then a hybrid table with small pockets and 2¼-inch balls proved the battle-ground of the two most notable exponents of the pocket and cannon games of their day, John Roberts and Frank Ives, respectively, but the unchecked cannon outweighed the scoring from the hazards. The cannon player steered the big balls to the mouth of the small pocket openings, and cannoned away to his heart's content. And the ideal in the way of a compromise has yet to be found. French billiard tables will doubtless in the years to come gain a new lease of life by reverting to their former pocket receptacles, but for the time being they still most rigidly adhere to the cannons.

AMERICAN POOL.—Of all the side-lights known to the American billiard table, which, like the French, is merely furnished with pockets as a means towards this end, none have met with such exceptional favour as the game of fifteen-ball pool, or, as it is more generally known, American pool. There is a certain similarity existing between the old-fashioned English game of pyramids and the more recent adaptation styled Snooker's pool with this fifteen-ball pool, which, as its name would lead one to suppose, is played with fifteen balls. These balls are numbered from one to fifteen. They are placed upon the table in the shape of a triangle, as in pyramids. A deep-red ball, which carries the highest number—fifteen—is set on the pyramid spot, and it forms the apex of the triangle pointing towards the baulk end of the table. The object of each competitor is to pocket as many balls as his skill will enable him to do, the amount of his scoring being dependent upon the numbers carried by the balls he has pocketed, and the player who scores the largest aggregate is declared the winner. In this respect the play decidedly favours Snooker's pool in its vicissitudes and in the element of chance which may enter into a contest between two well-matched opponents, whereby a much inferior cueman may defeat an infinitely superior player. A white ball is used as the cue-ball, and the players use it in their turn from the position it may be left upon the table, or from baulk if it happens to be "in hand." The one rule at variance with all classes of pool games played upon the English type of table is the strict ban set against playing on a pool-ball behind baulk when the player is "in hand."

In the past, many well-known English professionals have visited the United States and crossed cues with the cream of the talent there at American pool. Usually, however, Britishers have come off second best. The chief requirement for the game is accurate hazard-striking and a very keen eye for the whereabouts of the most valuable balls—that is to say, those set with double figures. It is obvious that the lower-scoring ones, say from one to five, are only intended to be utilised for the purpose of getting the cue-ball well placed for a shot at the big figures, just as in Snooker's pool. A greater latitude is extended to those who take part in American pool than any English game allows. For example, the "push-shot" now declared illegal in every type of English billiards is not barred in American pool; a player may make use of the butt-end of the cue to take a stroke with, a procedure long ruled out of the English game; and although the cue-ball may be touching one of the pool-balls, such a position does not invalidate a stroke in any respect.

Subjoined are the rules of the ordinary game of American pool, which are amended and revised in greater or lesser form in what is termed the championship code, expressly framed for the highest class of professional expert. They present the different phases of the play in very clear fashion.

RULES OF THE GAME OF AMERICAN POOL.

1. The order of playing may be settled by throwing out small numbered balls from a pool basket. The player plays from behind the string, the starting point for the white balls, as in the ordinary game of French or American billiards, and he may miss if he likes; but the miss, and all misses, score 3 points against the giver. The remaining players follow the first striker in their given order.

2. The player may use either the butt-end of the cue or the tip-end.

3. The player may jam his own ball against the others while the cue-tip is still in contact with his own ball and while the latter strikes an object-ball.

4. As the figures on the fifteen-pool balls amount to 120, of which 61 is more than half, whoever may make the latter number first is the winner, and may claim the game.

5. Three points are deducted from a player's score for making a miss or a losing hazard, or forcing his own ball off the table. If the player pockets one or more of the object-balls and his own ball at the same time, he cannot score for the numbered balls, which must be placed on the spot or in a line behind it if the spot be occupied, and he forfeits three points for his losing hazard.

6. The proper pocketing of a pool-ball still counts to the player even when the cue-ball and object-ball or balls are touching one another.

7. When the cue-ball is "in hand," the player may play from any place within the string (or baulk-line) at any object-ball outside it. Should none of the object-balls be outside the line, he may spot that which is nearest to the line upon the spot which the highest numbered ball occupies at the start of the game—namely, the pyramid-spot—and play on to that ball from "hand."

8. Should there be a tie between two or more of the highest players, its decision may be deferred to the succeeding game, and whoever counts highest in that shall be declared the victor in the tie-game, totally independent of the match that is then proceeding. A player might thus win an undecided game at fifteen-ball pool as the result of scoring but one point in the succeeding game should his opponent fail to score. Should a tie again occur in the second game, it may be referred to a third trial.

9. Should the striker while taking aim or while engaged in the preliminaries of a stroke or upon the actual stroke, disturb any ball on the table, the stroke is foul. If it be the cue-ball that is disturbed, the player will be considered to have played his stroke, and he forfeits 3 points if the cue-ball does not strike a pool-ball. If the ball disturbed is an object- or pool-ball, he may play for safety, but cannot score. Should any ball be disturbed after the stroke is played—that is to say, after the cue-ball has left the cue—it is a foul; but the player will be allowed to score what points he may have gained on the stroke, and he can only play for safety with his succeeding stroke. Should any of the balls on the table be accidentally disturbed by any other person than the player, they should be replaced, as nearly as can be gauged, in their previous positions, and the game is continued in its proper order.

10. Should a player play out of his turn when not called upon to do so, this act is foul, and, no matter the number of strokes the offender may have taken, the balls should be reset in their original positions, and all the offender's points gained during his out-of-turn play shall be forfeited. On the other hand, if a player be called upon to play, and he makes more than one stroke before being checked, even if it should be out of his proper turn, the strokes so made are fair, and he is entitled to any score he may have made by such strokes.

11. The losers of the game are the player or partnering players who have the lowest score; and it is possible, by reason of different forfeitures, for a score to be half-a-dozen or even a dozen less than nothing.

BIRD'S NESTING.—This favourite hobby of boys, and to a lesser extent of their elders, has, on account of much real, and some imaginary, cruelty, been condemned on all sides. While considering it desirable to give some few hints on the subject of successful collecting, it is not proposed to go into the details of individual nests. The scientific interest in the pattern of eggs lies in their "protective" colouring; and at a very early stage of his rambles the collector will not fail to observe this, more especially in connection with those laid on the ground. Nor will it escape his notice that all eggs laid within hollow trees, and similar situations in which protective colouring would be of no use, are pure white, or at most faintly marked with pale red.

Apparatus.—This may be of the simplest, comprising a small tin box of cotton wool (a nest of three boxes is economy of space and is recommended for whole-day excursions), a forked stick, an egg-drill, which can be purchased at natural-history stores for threepence, and a blower, easily made over a gas-jet from a penny piece of fine glass-tubing. With this unpretentious equipment, added to twelve feet of knotted rope and a small bottle of clean water, the writer collected over three hundred British eggs, most within five miles of his door.

Not but that the paraphernalia can be multiplied so as to suit the longest pocket and most extravagant tastes; and there are writers on the subject who freely advocate the use of expensive climbing-spurs, field-glasses with which to survey distant nests, and mirrors to reveal the contents of nests hidden in hollow trunks. That these are adjuncts to comfort few will deny; but it is at any rate doubtful whether this elaborately equipped collector derives half the pleasure experienced from a more rough and ready mode of procedure.

Binoculars, indeed, may be discarded, for they merely encourage laziness, while, as climbing-spurs often bring disaster to the climber and ruin to the tree, they may also be rejected in favour of a stout rope.

Method of Collecting.—A keen eye and soft tread, unflagging patience and a steady hand are the qualifications of a successful collector. Given these, the rest is a matter of practice. Some slight knowledge of sites affected by the various bird-families, a sense of discrimination between the denizens of tree, hedge, and ground, with some idea of the different breeding-seasons—these are the groundwork of the practical experience gained later.

A regular system should be followed at the outset. The best method is to map out a fixed area for each day's operations, and thoroughly search it each morning or evening.

To take an example: at Bexley, where the writer obtained the bulk of his collection, each day in the week was devoted to a particular ground, the chief being the north and south portions of Dartford Heath, Baldwin's Park, the dense shrubberies bordering the Cray Valley, some wild ground near Sidcup, and a thick wood, now fenced in, on Cold Blow. The intervening fields were much built in by larks and pipits.

Blowing.—Each egg should be blown

when taken, the only exception being an occasional "hard-set" specimen of sufficient value to take home and empty at leisure with forceps and fine crochet-hooks.

For the soft eggs, one hole only is necessary, and it should be drilled in the middle of the egg, not at either end. The shell is first carefully pierced with a clean needle, then the arrow-head of the drill is inserted and a rotary motion imparted so as to make the hole perfectly circular and clear its edge of the inner membrane. Next, stir up the yolk and white with the needle, being careful not to enlarge the hole further.

The pointed end of the blowpipe is then rested lightly in the aperture, and, on blowing gently, the mixed contents soon escape. When the shell is nearly empty, a little clean water is injected with the aid of the blowpipe, and the egg is turned in every direction in such a manner that the water reaches every point in its interior.

Poisoning.—The egg is then relegated to the wool-lined box, and, immediately on reaching home, the collector should inject a few drops of solution of corrosive sublimate. A separate blowpipe should be used for this, and a very convenient form will be found in the pen-fillers (fitting in a glass bottle) supplied with stylographic pens. Sucking a short tube, the other end of which lies in corrosive sublimate, is not recommended. The final stage is the drying of the egg, hole downwards, on a clean sheet of white blotting-paper.

Varnishing and Waxing.—Two further processes are advocated by many writers ere the egg finally rests in the cabinet. These are varnishing and waxing.

The first-named, imparting as it does a polish that is not, save in certain eggs, found in nature, is not desirable. One might as well decorate the white eggs with fancy patterns!

Waxing is more legitimate, since it counteracts to some extent the rapid fading of the exquisite transparent tints. It is not by any means a complicated process, consisting in the introduction of a *little* suitably tinted melting wax, the egg being revolved so that it shall dry in a coating of uniform thickness over the interior.

Stocking.—When not being inspected, all eggs should be kept from the light, which soon attacks their delicate colouring. The most pleasing way of stocking them is a matter of individual taste. Some prefer spending considerable sums in elaborate cabinets of many drawers with glass lids, simply resting the eggs on cottonwool. Others paste them, hole downwards, on cardboard. In any case certain particulars should be recorded on a label corresponding with each egg (*not* gummed on the egg itself), such as species, date and locality of collection, position of nest, &c.

Should a complete *clutch* of eggs be deemed necessary, it is best, with the birds at all events (the starlings, hawks, crows, &c.) that mate for life, to remove one egg at a time and allow the hen to lay twice the usual number. In national collections, where things are done on a large scale, the whole nest is taken and preserved along with the full complement. For scientific purposes this wholesale robbery of our woodlands may be perfectly legitimate; for private collectors, however, having no other purpose to serve than to acquire a representative collection, with the accompaniment of much pleasant outdoor rambling, it should be tabooed.

It is this very tampering with the nest that has cost the birds so much time and labour and skill that has brought bird's nesting into such disrepute.

F. G. AFLALO.

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BISON (*Bos americanus*). — The American Bison, like its European congener, is on the verge of extinction, and as a beast of the chase it has already practically vanished, though a dwindling remnant of the northern form may still occasionally yield a trophy to the sportsman hardy enough to brave the wintry desolation of Athabaska. A very few head are left in the Yellowstone National Park, but are being killed out by poachers. There are several small tame herds here and there; and there are one or two spots in the Rocky Mountains, and possibly one on the Mexican border, where two or three individuals still linger in a wild state. These are all.

BISON.

Height at shoulder, 5 *ft.* 6 *in.; av. horn meas.* 16½ *in.; max. horn. meas.* 20⅜ *in.*

Yet, in the late seventies and early eighties of last century this was the characteristic animal of the plains, and still swarmed in the Upper Missouri Basin. It was hunted in two ways: by running it down on horseback, in which form of chase the heavy revolver was the weapon usually preferred, and by still-hunting, or stalking, on foot. The last was the method by which the great slaughter of the herds was accomplished. The hunters used long-range rifles, Sharps being probably the favourite weapon. These rifles were usually of .40 or .45 calibre, with a long heavy bullet, backed by about 100 grains of powder; they were very accurate long-range weapons, and as the buffalo (as the bison were always miscalled) were slow and stupid animals, a good marksman and skilful hunter could often slaughter twenty or thirty at a "stand," as it was termed.

I never came in contact with buffalo myself until at the very end of its existence as a species, and shot only two, one an unusually large solitary bull on the Little Missouri in 1883, and the other a very fine herd bull in South-western Montana in 1889. The first I stumbled across, and slew out of hand, with one of the ordinary buffalo rifles. The second was procured only after very careful tracking through a mountain forest, and was killed with a single bullet from my Winchester.

My brother was in at the death of the southern buffalo herds early in 1877 in North-western Texas. He had full experience of both kinds of chase. Running buffalo on horseback was by far the most exciting method of killing them. The secret of success consisted in racing at full speed from the very outset, since the buffalo, though not very fleet, possessed marvellous endurance, and in riding up almost within arm's length of the brute before firing. It is a very difficult thing to shoot with any accuracy from a horse running at full speed, and especially at another object going at a somewhat different rate of speed. If the shots are fired from any distance, they are apt to miss or only wound. The true method was to push right alongside and fire with the muzzle of the weapon but a couple of feet from the animal's back. It was important that the horse should be trained to sheer off as soon as the shot was fired, as the buffalo sometimes turned and charged with great fury. On a well-trained hunting-pony there was little danger, for the buffalo had neither the pace nor agility of the horse. An untrained horse, however, was generally afraid to come to close quarters, and, moreover, turned clumsily. I know of one instance where riding a large untrained Eastern horse caused a hunter to lose his life, the buffalo making good his charge and inflicting fatal injuries on both horse and rider. Even in this branch of the sport, however, accidents to life and limb from the quarry were not common, though there was no little risk from the falls naturally incident to riding at full speed over rough and broken country. It was a splendid sport, full of excitement, and it is melancholy to think that it is gone for ever.

Still-hunting the buffalo did not differ materially from still-hunting any other kind of game, except that it was rather easier when once the haunts of the bison were reached. Most game animals are adepts at concealing themselves, but the buffalo never sought concealment, and its huge black body could be seen against the yellow prairie as far as the eye could reach; its sense of smell was very acute, but its eyesight was poor, and so stalking was easy. Occasionally the beast charged, but against heavy rifles in skilful hands his prowess availed nothing, and the danger was so inconsiderable that with anything like proper caution it could be disregarded.

Pursuit by sportsmen had practically nothing to do with the extermination of the bison. It was killed by the hide hunters, red, white, and half-breed. The railways, as they were built, hastened its destruction, for they gave means for transporting the heavy robes to market; but it would have been killed out anyhow, even were there no railroads in existence, and, once the demand for the robe became known to the Indians, they were certain to exterminate it in time, even had the white hunter refrained. Not even in South Africa has there been an instance where so many large game beasts of one species have been slain within so short a time. Originally the bison ranged between the Rocky Mountains and the Alleghanies and from Mexico to the Peace River; but its centre of abundance was the vast stretch of grass land reaching from the Saskatchewan to the Rio Grande. All the earlier explorers who crossed these great plains, from Lewis and Clark and Pike onward, dwelt upon the astounding multitudes of the bison, who furnished the entire means of subsistence for the tribes of Horse Indians. The herds were pressed steadily back, but the period of greatest slaughter did not begin until after the Civil War; then the commercial value of the robes became fully recognised, and the Trans-Continental Railways rendered the hunting-grounds more accessible. The slaughter was almost incredible, for the buffalo were slain literally by millions every year. They were exterminated first from Canada and from the Southern plains; it was not until 1883 that the last herd was killed from the Great North-western plains; and when the fierce greed of the skin hunter and skin buyer had exterminated the last of these great herds, there passed away what was perhaps the most imposing feature of American wilderness life.

THEODORE ROOSEVELT.

BISON AND BUFFALO.—Bison and Buffalo form two very distinct groups of the great Ox tribe, so different from the more typical oxen that by many writers they are severally assigned to two separate genera—**Bison** and **Bubalus.** All the members of the group are, however, so intimately connected that it seems preferable to include them in the typical genus **Bos.** Both the English names have, unfortunately, been applied to animals to which they do not belong, the American Bison in its native country being almost invariably termed the Buffalo, whereas by Anglo-Indian sportsmen the Indian Gaur is as generally spoken of as the Bison. Properly speaking, Bison include only the **European** and **American Bison,** whereas under the title of Buffalo are comprised the **Indian Buffalo,** the **Cape Buffalo,** and the Short-horned **West African Buffalo,** together with a small form from the Philippines, which is not improbably nothing more than a hybrid between the Indian species and a small buffalo-like animal inhabiting the island of Celebes, known as the **Tamarao.**

The two species of Bison have their nearest relative in the Tibetan **Yak** (*Bos grunniens*), which serves in some respects to connect them with the more typical oxen. An essential feature by which the Bison are allied to the Yak and the typical oxen is the possession of fourteen or fifteen pairs of ribs. Their horns, too—although smaller—have the cylindrical form of those of the Yak; but in the setting-on of these appendages Bison differ markedly from the latter. Not to enter into details on this point, it will suffice to state that Bison have their horns set lower down on the skull, while the skull itself—in addition to certain other features—is characterised by the marked convexity of the forehead and the tubular form of the sockets for the eyes. The external form of the Bison is too familiar to need much mention. The characteristic elevation of the withers—and the consequent lowness and apparent weakness of the hind-quarters—is the result of the great height of the spines projecting from the upper surface of the vertebræ of the fore part of the trunk. This elevation of the withers is enhanced by the mass of long hair clothing the fore-quarters, which also extends on to the neck, head, and fore-limbs. Elsewhere the hair—in the winter coat—is comparatively short and curly; and since in spring this coat is shed in large irregular patches Bison at this season present a peculiarly ragged and unprepossessing appearance.

The European, or True Bison (*Bos bonasus*) — frequently miscalled the **Aurochs**—appears to have been on the wane ever since the glacial period, soon after which it disappeared from the British Islands. As a wild animal, its range has been gradually contracting on the Continent, and now, apparently, it remains only in certain parts of the Caucasus—where it appears to be rare—and in a protected condition in the forest of Bielowitza, in the Government of Grono—the ancient Lithuania. There are, indeed, reports of its survival in parts of Wallachia and Moldavia, but these it is difficult to verify. A small herd is, it is true, kept by the Prince of Pless in Silesia, but this appears to be composed of introduced animals, and has been replenished from Russia. In Bielowitza and the adjacent forest of Swisslotsch, the Bison have been steadily on the wane since the year 1857, when they numbered 1,898 head, although the rate of decrease has been by no means regular, and has at some periods been accelerated by popular disturbances, disease, and other adventitious causes. Of late years the decrease in numbers has been very marked, the herd (inclusive of a small number confined in the Zoological Gardens at Bielowitza) having declined from 600 in 1882 to 380 in January, 1889, although by 1892 (since which date the numbers do not appear to have been published) it had again risen to 491. In-and-in breeding seems to be

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A HERD OF AMERICAN BUFFALO IN YELLOWSTONE PARK.

producing the usual results—namely, infertility on the part of the cows, and the birth of an unusually large percentage of bulls; and it is only too probable that the term of existence of the Bison in Lithuania will be very limited. Information is lacking as to the prospects of the survival of the Bison in the Caucasus.

In place of being a forest-dwelling species, the nearly allied **American Bison** (*Bos americanus*) is—or rather was—a dweller on the open prairies, although a variety known locally as the "Wood-Buffalo" accustomed itself to a different mode of life. The American species is so closely allied to the European that it is a somewhat difficult matter to define the points of distinction, although when the two animals are seen side by side, their points of difference are manifest enough. Although, on the whole, a more heavily built animal, the American Bison is less tall than the European species, with weaker hind-quarters; but the deficiency in height is largely veiled by the much more abundant hair on the head, neck, and forequarters.

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TIBETAN YAK (*Bos grunniens*).

The story of the practical extermination of the American Bison is told elsewhere, so that very few words must suffice on this occasion. The marvel is that an animal which existed in such countless thousands, and enjoyed such a vast geographical range—a range far greater than that of any other of the *Bovidæ*—should have been wiped out in such a short space of time. In 1869, when the Union-Pacific Railway was completed, the Bison still flourished almost in its original numbers. After the division of the animals into two great herds by the railway, the great period of the slaughter of the southern herd occurred in the seventies, by the end of which the herd, as such, had practically ceased to exist. Not but what numerous smaller herds remained for several years, although early in the eighties Bison-shooting in the south came to an end, for the very good reason that there were no animals to shoot. By the same date the northern herd had been decimated, and that was soon reduced to a few straggling parties, all of which were afterwards killed off, save for a small band which reached the Yellowstone Park, where they and their descendants have since received Government protection. These, and a certain number of the southern herd which fled to the wilder parts of Texas, are all that remain of the millions that formerly populated the prairies of the North-West.

Whereas Bison, as we have seen, have high withers, shaggy fore-quarters and heads, and cylindrical horns, the animals to which the name **Buffalo** should properly be restricted are characterised by the nearly uniform height of the back, the comparatively sparse coating of hair over the entire skin, and the more or less markedly triangular horns. So thin, indeed, is the hair in aged individuals that in many instances the skin of the greater part of the body is almost completely bare. As further "points" of Buffalo may be noticed the broad muzzle, the large, flapping ears—often heavily fringed with long bristly hair—the deep and short neck, and the moderately long and tufted tail. More important than all these features is, however, the reduction in the number of pairs of ribs to thirteen. All the Buffaloes are old-world forms—as, indeed, are all the oxen, save the American Bison.

Although Buffalo form a well-defined group of the genus *Bos*, the differences existing between the various species are very much more accentuated than is the case with the Bison, the African species forming one section of the group, and the Oriental another. Of the former, the largest and best known is the **Cape Buffalo** (*Bos caffer*), whose typical range extends from the Cape to about the equator. Among the especial distinctive features of the typical form is the enormous development of the bases of the much-curved horns, which in old bulls form a huge mass covering the whole of the upper part of the forehead, and separated only by a narrow groove at their junction. Furnished with enormous, flapping ears, thickly fringed at their margins with hair, the head is remarkably short, with its profile deeply concave in the region of the eyes, and having a distinct hollow near the inner angle of each of the latter. Whereas in cows and young bulls the black skin is fairly well clothed with short dark brown hair, in old bulls it becomes almost completely naked. On the ears and tail-tip the hair, however, always persists. [*See* BUFFALO, CAPE.]

Such is the typical southern form of the Cape Buffalo. When, however, we cross the equator and proceed towards Abyssinia, an animal of a somewhat different type is met with. This is the *Bos centralis*, or *Bos aequinoctialis* of the older writers. In this form the whole build is much lighter and the size smaller, while the hair is lighter coloured and the horns have their bases much less thickened, and separated from each other by a median line of hair. Although some of these Abyssinian Buffaloes differ very markedly from the typical Cape form, yet in the intermediate regions the two seem to intergrade so completely that it appears impossible to regard them in the light of anything more than varieties of a single very variable species.

Passing into Western Africa, we meet another somewhat small and lightly-built Buffalo, which, although showing considerable resemblances to some examples of the *Bos aequinoctialis*, is generally admitted to the rank of a distinct species, under the name of the **Red** or **Short-horned Buffalo** (*Bos pumilus*). The colour of the hair is generally some shade of reddish or yellowish, although occasionally showing a brownish tinge, and the horns, which are relatively small, are completely separated from one another in the middle line. Two races of this species have been described—the one from the Congo district, and the other from Sierra Leone and its neighbourhood. In the Congo race the upwardly curved horns are very distinctly flattened at their base; and it is this race which approximates so closely to the so-called *Bos aequinoctialis* of Equatoria, and thus gives rise to the suspicion that the Short-horned Buffalo is, after all, nothing more than a highly aberrant modification of the Cape species. On the other hand, in the Sierra Leone, or north-western type, the horns show extremely little trace of basal flattening, and are very widely separated from one another on the forehead, while the direction of their curvature is different.

[*Photo. by A. Radclyffe Dugmore.*

A HERD OF AFRICAN BUFFALO.

With the Oriental Buffaloes we come to a very distinct type, which probably includes only one true species. This is the **Indian Buffalo** (*Bos bubalus*), whose proper habitat is formed by the lofty grass jungles of certain parts of India and Ceylon. It is true that reputed wild Buffalo are found in Burma and the Malayan peninsula and islands, although it is probable that these are really descendants from animals originally introduced by man. Many of these feral races—as they are scientifically called

—have become very much dwarfed in size, this being especially the case with those inhabiting Java.

The distinctive features most easily recognised in the Indian Buffalo—the *Arna* of the natives—are the length and comparative slenderness of the head, and the enormous dimensions attained by the widely-spreading horns, which are always separated from one another by an interval of great extent, and show no trace of a basal expansion. They are, too, much more distinctly triangular throughout their length than are those of the African species, from which they also differ in their direction. There is a marked sexual difference in the direction taken by the horns, those of the females extending almost directly outwards from the head for a long distance, whereas those of the males curve upwards in a bold sweep immediately after rising from the forehead. Apparently, however, in the Assam race the horns of the bulls are directed much more outwardly than is elsewhere the case. Equally distinctive of the species are the smaller and more compact ears, of which the margins are devoid of a distinct fringe of hair. Although the usual colour of the sparse hair and skin is blackish-grey, a dun-coloured variety is found in parts of Assam.

In addition to being domesticated throughout the Oriental countries, the tame Indian Buffalo has been introduced into Asia Minor, Italy, and Egypt, where it appears to flourish as well as in its native home.—[*See* BUFFALO, INDIAN.]

A small sturdily built Buffalo from Mindao in the Philippines, locally known as the **Tamarao,** has been described as a distinct species, under the name of *Bos mindorensis*. In colour it resembles the Indian species, with which it likewise agrees in its markedly triangular horns. Instead, however, of curving outwards and upwards, the horns are directed upwards, with a marked divergence, but with little or no curvature. The whole appearance of this diminutive animal—which is only about 3½ feet in height—is strongly suggestive of its being a cross between the small Malayan race of the Indian Buffalo and the little **Anoa** of Celebes. That it breeds true at the present day, and thus forms a well-marked race, may be freely admitted; but its claims to rank as a valid species are doubtful in the extreme.

Although the **Anoa** (*Bos depressicornis*) of Celebes can scarcely be regarded as a true Buffalo, yet its affinities are clearly with that group. The upright direction of its horns, and other features, indicate, however, a decided approximation to the Antelopes. To a young Buffalo the Anoa presents a more decided resemblance than to the adult. The small size of this species (3 feet 3 inches at the withers) is in harmony with the small area of its habitat.

R. LYDEKKER.

BLACK GAME (*Tetrao tetrix*).—British sportsmen are generally alive to counteract, if possible, any danger which may threaten the extinction of a creature of the chase in which they take special interest. This, we are happy to think, has been the case with the black grouse, for there is considerable reason to think that, on the whole, there has been a marked increase in their numbers since the agitation occurred in their favour a few years ago. Nowadays the gray hens are seldom shot, save by accident; and though the birds have vanished from many of their old haunts, there are now in Scotland, their chief home, an equal number of fresh districts in which they have become more or less plentiful. Close observation tells us that the gray hen breeds for two or three seasons only, after which she becomes barren and useless; and the introduction of square-mouthed drains on moor edges accounts for the destruction of a large percentage of young birds.

Distribution.—The best districts in Scotland for black game are Dumfriesshire, Roxburgh, parts of Perthshire, Inverness-shire, Ayrshire, Aberdeenshire, and Argyllshire. In England they are numerous in the counties of Westmorland, Cumberland, and Northumberland, whilst good bags are occasionally still obtained in Somersetshire; and until very recently the birds have been killed in every county from Cornwall to Caithness. In Wolmer, the New Forest, and Staffordshire, black game were formerly plentiful, but are now practically extinct. Re-introduction is, in their case, a failure; for the repeated efforts to re-establish the species in Norfolk, the New Forest, Wolmer Forest, and Ireland have met with no success.

Habits.—Black game love the rough and broken country bordering cultivated and arable land. Though wandering in early autumn far out into the open moors, the first breath of winter sends them to their true home amongst the deep heather and rough grass lying beneath the birch and fir woods. From this cover they emerge in early morning and in the evening in search of their food supply, which, to such omnivorous feeders, practically comprises

After Archibald Thorburn.

BLACK GAME.

everything in the shape of grain, seeds, fruit, and insect life that the various seasons afford. As the winter comes on, and the birch buds, a favourite food of theirs, give out, they will sometimes take to the Scotch firs and devour the youngest shoots, but will not do so unless driven to it by stress of weather. A lack of food supply frequently causes vast migrations of these birds in Norway, Sweden, and Russia; but in our islands, a movement on their part is uncommon except for short distances, and then only confined to individuals and small parties.

The first signs of spring awake the martial instincts of the black cock. By nature, he is a warrior, and those who have watched him in his spring battles cannot fail to have the greatest affection for him, for he is such a veritable *preux chevalier* and settles his little differences so like a gentleman. By the end of March, the black cocks come regularly adorned to their playing-ground, generally an open space of short green grass on the fringe of the moor. The noise made by the birds, each of which selects a station some fifteen or twenty paces from his neighbour, can be heard on a still frosty morning at a distance of nearly two miles; it is a gentle purring sound not unlike the word "whirroo." At intervals, too, the black cocks, particularly if a gray hen has been observed near the battle-ground, set up a loud screeching noise not unlike cats fighting at night. In April, when the gray hens begin to come regularly to the lists, there to be fought for and appropriated, the black cock who first observes a possible spouse approaching throws himself up in the air and flutters up perpendicularly like a lark to a height of twenty or thirty feet. His example is immediately followed by all the other black cocks, who, each and all, endeavour to screech the loudest to attract her attention. Black cocks fight long and savagely, often till one or other of the combatants is disabled, though, as with our species, there is a good deal of talk before they begin. No immature cock is allowed to enter the ring. On fine days, in late autumn, black cocks frequently go through their spring pantomime, exhibiting many of their previous antics and calls; but this exhibition is but a subdued version.

By the middle of May the gray hen has formed a nest of loose dry grass, and in it she deposits her eight or ten eggs, the first brood being seen generally about the beginning of June. Though the gray hen is an excellent mother, the young are extremely delicate, and more than half, as a rule, fall victims to various causes. When the chicks are no larger than thrushes, they can fly well, and, if flushed, will readily alight in the trees, where, by the way, the mother generally takes them to roost for safety's sake.

With the moulting of his glorious plumage, the black cock's fiery nature vanishes; he becomes shy, and spends much of his time, with a few companions, hiding in the thick bracken; and as the autumn advances, the regular winter parties are formed. The breeding hens and young of both sexes go together in small or large numbers, whilst the old black cocks form a separate pack or party, sometimes numbering as many as three hundred, as the writer has seen at Doune, in Perthshire. The barren hen goes on her own account, though it does not, of the least necessity, follow that the single hens which are so noticeable in covert shooting are unfertile.

Shooting.—The flight of black game is very rapid when they are once under way, about the same as that of grouse, but performed with greater ease and less scurry, and capable of being extended to a much greater distance. The law permits shooters to butcher black game as early as August 20th, but no one who is anything of a shot or has any appreciation for the beauties of nature should ever kill his birds before the middle of September, unless they are actually wanted for the pot. Till this time, when walked up, they are neither an attractive nor difficult mark, whereas, if driven later on, they fulfil every necessary qualification of a high-class bird of the chase.

Driving.—When driving, it is well to remember that black game are not too easy to kill; their pace is slightly deceptive, and it is best, therefore, to take both one's shots in front if possible: the gunner, too, must be well on the alert to observe their approach, as they are very silent when coming forward, and he must be ready to shoot very smartly in case they resort to the dodging header, a ruse they often attempt if frequently driven.

Black game are as obstinate as government mules when they do not wish to go. With a few trained beaters, a good keeper who knows their lines of flight and passes will put them to the guns better than an army of irregulars. Lying in the stooks in an October evening is capital sport, and a few old black cocks shot as they come in to feed afford almost as much fun as duck shot during flighting. Dull misty weather is the best for black game shooting, as the birds go straight ahead, and do not get into large packs coming on all at once.

There is very little poaching of these birds in Scotland beyond snaring on the stooks, but in England silk net is used to some extent in the border counties. Their strength, speed, and fine sight, too, gives them a fair immunity from the attacks of vermin, the Peregrine alone stooping and killing one occasionally; and then but for sport, for their flesh is not esteemed by the raptorials. A black cock makes a charming pet, and becomes very tame, and his attitudes in the spring are interesting and amusing to watch.

Black game have been known to interbreed with Capercailzies, Pheasants, Grouse, Willow-grouse, Bantam, and common Fowl, the hybrids usually being very dark and taking after the black cock, whose progeny they generally are. As with most hybrids, the young are generally males, the most frequent cross being that with the Capercailzie, which may be said to be almost common. Gray hens, too, not infrequently, partially assume the plumage of the male. Whole or partial albinos are extremely rare. [*See also* GROUSE.]

J. G. MILLAIS.

BLACK COCK TOURNAMENTS.—A custom prevails in Russia of shooting the male birds of the black game family during the mating season, a practice excused by northern sportsmen on the ground that the males of this species greatly exceed in numbers the female birds, and that, in their rivalry for the latter's favours, the cocks destroy numerous sittings of eggs by fighting over the very nest. Those who know the black cock only in the broad light of day may be surprised to learn that in the early hours of a spring morning—from about 2.30 a.m. until sunrise—these birds hold what is to all intents and purposes a tournament in some selected clearing between the forests, or in convenient belts of open woodland. Hither flock the gray hens from their nests, each one watching from bush or tree on the borders of the lists, and flying off anon with her victorious knight.

In the lists, however, the black cock rarely comes to blows, though serious fights are said to take place afterwards over the nests.

In order to discover the chosen tourney-ground of the sable warriors, it is essential to pass a night or two in the forest, a function generally performed by the keeper, who may hear from a mile away the hectoring and crooning of the combatants, and will then creep to the edge of their battlefield in order that he may select the exact site for his pine-bough shelter (*Russicè, Shalashka*) in which the sportsman is destined afterwards to crouch. The pine branches are placed end-up in a circle, their tops converging to a point, the base enclosing a space about five or six feet in diameter.

Within this space, shortly after midnight, the sportsman takes up his position and waits until, with the earliest indications of coming dawn, the black-plumed champions arrive one by one with a rush and a whirr through the darkness, and alight unseen with a thud close to his ambush, the site of which the keeper has chosen with care. Presently a great crooning arises from many throats, growing in volume until the sound becomes absolutely oppressive. Suddenly, a champion issues his challenge: *chu-wish! chu-wish!* and in an instant the defiance is taken up from every side. The knights close in to the fray, and the bloodless tournament commences, each pair fighting, or pretending to fight, like any two pugnacious barndoor cocks in a farmyard.

It is then that the sportsman may, when the light becomes strong enough, shoot many times without clearing the field, the spectacle of slaughtered companions neither alarming nor even, to all appearance, surprising the survivors.

No sooner, however, does the rising sun appear than all hasten from the lists, and the sportsman should remain concealed until the very last bird has disappeared, otherwise his ambush will not avail him a second night.

FRED WHISHAW.

BOAR, WILD.—**Habitat.**—Luckily for hunters as a class, the range of the wild boar (*Sus scrofa*) is almost world-wide. On the American Continent, indeed, he has no place, although in Old Mexico, and, it is said, as far north as Arizona, he is represented by a small variety of his race known as the *Peccary* (*q.v.*), which, though neither as large nor as well armed as the true wild boar, has some of the attributes of that grand beast, and (making due allowance for western exaggeration) must be endowed with very considerable pluck and pugnacity. Another distant cousin of the true wild swine has his haunt in South Africa, where he is known as the *Wart hog* (*q.v.*), a beast furnished by nature with tusks alongside of which the record tusks of Indian or Caucasian boars would look utterly insignificant; but occurring as he does in a country where there is such a prodigality of the more important great game, little is known of him as a sporting beast, and none but casual notice of him occurs in most of the African works on sport. From these, however, he appears to possess some of the pace and his share of the pluck and fighting qualities of his race. W. C. Baldwin, for instance, in his *African Hunting*, mentions, in passing, that his big staghound "Hopeful" was carried bodily away on the points of a wounded wild boar's tusks for full fourteen yards.

But the true Wild Boar is *Sus scrofa*, and though he is found in Northern Africa, in the Hawaiian and most of the South Sea Islands, and in other somewhat unexpected places, his true home is in India and Europe.

In very early days wild swine were plentiful in England, and Mr. J. E. Harting, in his *Extinct British Animals*, writes that, "to judge of the remains of the animal which have been found in various parts of the British Islands, Wild Boars at one time must have completely overrun the country. In Ireland they were even more plentiful than in England, though small and misshapen, and in Scotland also they were abundant. They grew to such a size that we have a record of one pair of tusks taken about 1124 which measured 12 inches in length and three in their greatest width. But the wild boar, like a good many better things in England, has had to make room for civilisation, and though his admirers have made several efforts to re-establish him in his old haunts, their efforts have been in vain." Public opinion, which will hardly tolerate the existence of a rabbit, rises in indignation against the wild boar, whose ideas on farming are certainly peculiar. It is, of course, impossible to fix the exact date at which any given animal became extinct in England, but from documents quoted by Mr. Harting it may fairly be assumed that there were wild boar in abundance in the forests round London in 1174: that the King and Prince of Wales hunted them near Windsor in September, 1617: that in that year boar were still to be found in Lancashire, and that almost at the end of the century (1683) wild swine still existed in England.

In France they exist still, and in Germany, Austria, Russia, and Spain they are plentiful, and still form a prominent feature in the great game drives of those countries.

From Europe eastward, the tracks of the wild swine are by every sluggish stream, his lair in every reed-bed, and his routings the ruin of every peasant's crops. From the Black Sea to the Bay of Bengal there is a ringing of bells by night, a blowing of horns and sounding of clappers, together with an irregular musketry fire all through the ripening time of the grain, and all this in honour of the great wild boar, who as soon as the dusk comes, steals out from the wooded foot-hills or the stony gorges, and trots down to the cultivated grounds to dine.

And the boar deserves all honour. He was England's noblest beast of chase in England's manliest days; and in England's great schooling-ground for soldiers to-day, what beast is his equal? Let some of the men who know him speak. In the *Wild Sports of India*, Major Shakespear says, "I consider that hog-hunting is the very first sport in the world." Col. Heber Percy in the Badminton volumes calls the boar "the pluckiest of all beasts," while Col. Kinloch, in his *Large Game Shooting in Thibet*, endorses both these opinions.

[*Photo. by W. P. Dando, F.Z.S.*

WILD BOAR (*Sus scrofa*).

Undoubtedly, if the boar has his due, he must take high rank amongst the beasts of the chase. It is even doubtful if he be not entitled to take the first place. For courage, he has no superior: it is much to say that he has any equal. I have myself seen a comparatively small boar fight his way through a pack of hounds; I have seen a broken-backed sow worry a dog nearly as large as herself; I have known a mortally wounded boar to lie in ambush for his enemy and kill him just before the dawn came and his own life was spent, while Major Shakespear (in the *Wild Sports of India*) writes of the boar's "utter recklessness of life" and of the "fierceness that will make him run up the hunter's spear, which has passed through his vitals, until he buries his tusk in the body of the horse." &c.

And again, the native Shikarees affirm "that the wild boar (of India) will quench his thirst at the river between two tigers." This is even more strongly put by Col. Heber Percy, who writes in the Badminton volumes on Big Game that several cases are on record in which an old boar has beaten off a tiger, and some in which the latter has been killed by a boar. As a matter of fact the old wild boar knows no fear, and whenever he does condescend to trot away from an intruding sportsman, he goes somewhat leisurely, under protest, and with an exceedingly savage gleam in his eye, plainly hinting that he would rather stop and fight than get up and run. And in this estimate of the boar's courage both ancient and modern authorities are agreed, from Holinshed, who speaks of boar-hunting as "a verie dangerous exercise," to Col. Kinloch (*Large Game Shooting in Thibet*), who proved that it was so by "about fifty wounds from one boar" in a single round. Nor is the boar's courage his only claim to high rank amongst beasts of the chase. He has not only courage, but pace, and in India offers to the sportsman that perfection of sport known as pig-sticking, in which riding, racing, hunting, and fighting are so happily blended that even an Irishman would be content with its glorious opportunities for fun and sudden death.

Pig-Sticking.—Naturally, with all these good qualities, English sportsmen delight in killing him, and have surrounded his obsequies with many rules and much ceremony. In India it is a maxim that the only sportsmanlike way of killing him is with a spear: it is a law that no boars shall be shot within forty miles of rideable ground. And to the average Englishman these laws and customs will at once appear to be founded on right reason. There is probably more danger in pig-sticking than in any other form of sport. The ground over which the riding has to be done is as little adapted to riding as it well could be; nothing annoys an old boar more than to be hustled at top pace before he has had time to digest his food; a spear is infinitely more difficult to kill with than a rifle; and if the hunter is in real luck, an angry boar may give him fifty wounds in five minutes that take nearly forty minutes to sew up and dress; a sow may run up his spear and fasten on his horse's chest, or at any rate his horse will be so knocked about by the rocks amongst which he has ridden that he won't be able to go out of the stable again for a fortnight. Hence it comes that hog-hunting is the most popular sport in India, and for those anxious to study it in all its details, numerous volumes have been written.

Here it must suffice to say that the boars are either intercepted in the early morning on their way from their feeding-grounds to their lairs in the foot-hills, or are driven from their lairs by beaters. Along the edges of the covert, horsemen armed with spears are stationed in dumb expectancy until the boar breaks. Then the signal to ride is given, and such as are within reasonable distance of the quarry press him as hard as their horses can before he has time to get his wind or gain covert, and despatch him, if they are lucky enough to get within range of him, by spear thrusts, delivered from the saddle, the honours of the run going to the man who draws first blood, or, as they say, takes the first spear, although it is by no means probable that the first spear will finish the business. On the contrary, a good boar is likely to give employment to most of those engaged before he dies. The spear used in this sport varies in the different districts from six and a half to seven feet long in Bengal, to eight or nine feet in the Bombay Presidency. [*See* PIG-STICKING.]

There would seem at all times and in all countries to have been a remarkable consensus of opinion as to the propriety of killing wild swine with a spear. Formerly in Britain it was used both on foot and on horseback; and in Hawaii, where they claim an indigenous pig and good rideable country, it is used to-day. In Britain it would seem from certain paintings and written records which have been preserved to us that the boar was not ridden down in the open as in India, but was first driven to bay by hounds, and then killed with a heavy jobbing spear, a sufficiently dangerous pastime even so, as is in some sort proved by the records of lands granted to certain gentlemen and corporations by the King for the destruction of notable boars which had committed great depredations, and by a curious clause, quoted by Mr. Harting from the *Book of the Rights and Privileges of the Kings of Erin*, which restrains one of the kings of Ulster from going into the wild boar's hunt or "being seen to attack it alone." One cannot help wondering whether, being Irish, that good king did not avail himself of the companionship of courtiers who were discreetly blind upon occasion. In Spain, in the old days (according to Mr. Abel Chapman), the "javato" was hunted on horseback with spear, pike, and lance, and even now in Estremadura is hunted with horse and hound "during the stillness of a moonlight night when the acorns are falling from the oaks in the magnificent Estremenian woods."

Shooting.—But there are many places where the boar cannot be ridden down even by Englishmen, places where no horse could gallop, and in these the boar gives very fair sport with the rifle, either to the stalker or the leather-lunged sportsman who with a small pack of hounds (three or four) drives him to bay in such mountain fastnesses as may be found on the shores of the Black Sea, or through such forest tangles as abound on the Caspian. In Russia, as I believe in Austria and Germany, the wild swine are shot in the great forest drives; but though they form a fine picture crashing through the frosted undergrowth, it is a poor way of killing them. The Caucasian peasants' methods are better. Like most other forest beasts, the boar is more or less nocturnal in his habits; and it is in the stillness of the night that those who watch learn most about him. When the moon is up and the pears are down, in August, the natives sally out with their old muzzle-loaders and catch the boar feeding under the pear trees, or with a white string knotted round their gun's muzzle for a sight, lie in wait by his path through the reeds to the water. Many of the guns used are poor things, the bullets and charges both light, the shooting inaccurate, and the light bad, and as in addition to this the boar's hide is at certain seasons almost impenetrable in places, this hunting is dangerous work. Not a few of the old Cossacks who indulge in it are badly scarred, and as for their hounds, unless they develop an extraordinary degree of caution and activity early in life, their careers are short.

[*Photo. by W. W. Rouch.*

A Stand in the Forest.

Appearance and Habits.—Throughout his wide range, the wild boar varies little in habits, size, or appearance. As a youngster, he is of a reddish-brown striped with darker colour; as he grows older, he loses the stripes; and as an old warrantable boar, he becomes a grizzled grey with an undercoat of black. As far as my own knowledge of him goes in the Caucasus and Russia, he is at all times a clean feeder, living upon roots, chestnuts, acorns, and the different fruits and crops, but some authorities maintain that he will devour a carcass if he comes across it. Night is his feeding time. In the day-time he lies up in thick scrub, generally near some soft ground in which he can wallow, and not necessarily near his feeding-ground, for he is a great traveller.

Measurements and Weight.—In weight and size he varies perhaps more than in any other particular, and from such data as I have been able to obtain I should imagine that the Caucasian boar, amply fed upon the fallen chestnuts and maize-fields by the Black Sea, is perhaps the largest of his race. Professor Raddle, of the Tiflis Museum, once wrote to me as follows: "The largest solitary boars, measured at the shoulder, and measured straight, stand about 105 centimetres, and their total weight, not dressed, rarely exceeds 15 puds (*i.e.*, 600 lbs.)." In India, on the authority of Captain Baldwin, Major Shakespear, and others, we have it that a boar which stands 40 inches high at the shoulder has attained to the maximum size of his race. In Hawaii, I have a record of a boar killed and weighed by my friend Mr. Purvis, which *dressed* 325 lbs., and judging (at hazard) from the records of certain tusks taken, the old English wild boar was not far behind the Caucasian beast.

Captain Baldwin, a very careful writer, gives the measurement of a boar killed by him in the Himalayas as five feet ten inches in length, and over three feet at the shoulder, but adds that boar in the Himalayas frequently exceed this.

Tusks.—As to the size of tusks, the principal trophies of the boar, Baldwin writes that "the tusks of a very fine Indian boar sometimes reach eight and a half and nine inches in length, but anything above this is exceptional"; whilst in Mr. Rowland Ward's book on Horn Measurements a pair of 10-inch tusks, secured by Sir Samuel Baker in India, are the largest recorded.

I have reason to believe that larger tusks than these have been taken in Hawaii, and I have myself measured a pair in the possession of a Caucasian Governor (Col. Verubof of Naltchik) which went 11½ inches round the outside curve. Certainly 9-inch tusks, and even 10, are not uncommon there; and I have myself secured a pair not unduly curved, well over 9½ inches. When the upper tusk has been lost by accident, it not unfrequently happens that an abnormal growth takes place, the lower, or fighting, tusk growing round and so attaining greater length, whilst it becomes useless as a weapon.

But perhaps there is no tusk on record at present to surpass those recorded by Boethius as taken from a boar killed in Scotland 1124 (or thereabouts), twelve inches long and three in their greatest width.

Clive Phillipps-Wolley.

BOAR-SHOOTING. — In considering the pursuit of the boar with the rifle on foot instead of with horse and spear, according to the orthodox fashion, it must be borne in mind that there are large tracts of forest in India swarming with pig that are absolutely unrideable from a pig-sticking point of view. These are so remote from ground on which that grand sport may be obtained that it cannot even be contended that they act as nurseries to maintain the supply of pig for the rideable districts. In these forests, Indian though they be, wild boar are perfectly fair game for the rifle.

In all forest-stalking it is hopeless to hunt in the middle of the day; the animals are then lying down, and if stumbled upon by accident, a rush through the scrub and a confused vision of vanishing sterns offer the sole chance of a shot. Early in the morning it is very different. The hunter, moving slowly and noiselessly in his india-rubber or felt-soled boots, either catches sight of a sounder (a herd) feeding on some grassy glade, or hears them rooting among the bamboos at the bottom of a ravine; sometimes he will intercept an old gray hog returning from his night's foray among the crops in the jungle clearings, or catch the sharp clashing sound of a heavy boar whetting his tusks, and be able to creep up within easy range for a shot.

Weapon, &c.—It may here be observed that a ball gun of the Paradox type is about the best weapon to use. Express bullets are too apt to glance from twigs to be absolutely reliable in forest shooting, and the writer has lost several beasts from this cause. Small-bore bullets also often leave no blood trail, and in forest shooting wounded animals are frequently lost through this defect.

The chief element of risk in boar-shooting is having to follow up a wounded beast in thick covert. The main rules to be remembered in such an event are—to avoid approaching any dangerous animal up hill, and not to be in a hurry, but to give time for the wound to tell on the animal's strength.

The unparalleled courage and ferocity of wild boar are referred to in the foregoing article. Still, it is only fair to admit that a boar will rarely attack unless something has occurred to ruffle its proverbially short temper. The writer, riding on one occasion unarmed over some open downs in Central India, espied a goodly boar making his way home after its night's ramble, and he trotted up to within about forty yards of it. The boar stood still and chucked up its chin defiantly. There was nothing more to be done; it was folly to risk a charge with only a switch to protect the horse; so each party drew off.

Another time, when after other game with a brother officer and two hunters, the sound of a boar whetting its tusks was heard; and on the party advancing in the direction of the noise, a sounder of pig was disturbed. The old sow and her family made off at once through the grass, but the boar came trotting back as if to cover their retreat. As it was essential for sport not to disturb the ground by unnecessary firing, no notice was taken of him, and he presently followed the others. The party had not, however, proceeded another twenty yards when the veteran came back again and barred the way with such evident malevolence that the sportsmen had to cock their rifles and place the natives behind them in case of attack.

It was rather a curious sight; on one side of a grassy glade stood four men, two of them armed with rifles, and on the other stood the huge old boar, almost white from age, shaking his head and daring them to come on. The utter unreasonableness of the whole affair was too ludicrous. The men had not the smallest intention of hurting him, except in self-defence; and if he declared war and charged across that open glade up to the muzzles of two rifles, the only possible result would have been his death. At last the old fellow seemed to make up his mind either that he had asserted his own authority, or that the enemy were too strong for him, and trotted off again; but on the party resuming their advance he at once turned and faced them a third time, but only for a few seconds, when, considering he had wasted enough time over them, he trotted off and rejoined his family.

Another rather absurd adventure befell the writer once when, intent on procuring pork for the larder, he had carefully selected a promising squeaker out of a sounder that were feeding among some bamboos at the bottom of a steep ravine. After shooting his selection through the head, so as not to spoil the meat, he clambered down to inspect his prize. He had barely time to examine it when there was a crash among the bamboos, and the long lean head of an evil-looking pig appeared, facing him, some ten yards off. There was no time to deliberate. The bottom of the ravine, where the writer was standing, was barely two feet wide; the sides were steep, and it was certainly no place to stand a charge, while avoiding one seemed out of the question. So a quick shot, which placed the bullet between those fierce little eyes, had to settle the matter. It was the old sow, unfortunately; but the place was too tight for careful discrimination.

R. HEBER PERCY.

[*Photo. by W. W. Rouch.*

MR. WALTER WINANS SHOOTING A RECORD BOAR.

BONGO (*Boöcercus euryceros*).—This large and magnificently coloured antelope was long classed with the bushbuck group. Recent discoveries, however, tend to show that, although in its coloration the Bongo has affinity with the bushbucks, in other characteristics it differs widely from those antelopes. The Bongo resembles the eland in the circumstance that both sexes carry horns, whereas in the bushbucks only the male bears these trophies. Again, the somewhat ox-like tufted tail of the Bongo reminds one much of the eland. The Bongo stands about 4 feet at the shoulder, and is, for its height, one of the biggest and most massive antelopes found in Africa. The coat is of a bright, shining, chestnut-red, the body coloration being varied by a number of vertical white stripes—usually from ten to thirteen. The forehead carries a white chevron; on the breast is to be found a white crescent, and there are two white spots below each eye. The massive horns run in an open spiral, and their brown coloration terminates in yellow points, to be accounted for, probably, by mere use and wear and tear. Good examples of male horns run from 27 to 32 inches, the record head, obtained in Ashanti, measuring 35 inches over the curve. The longest pair of female horns at present recorded reach 30½ inches. The ears are, as with the Kudu and other bush and forest-loving species, large and broad, and well adapted for carrying sound in the dense jungles in which this antelope makes its habitat.

It was for many years supposed that the Bongo was only found in West Africa, but more recently it has been brought to light in other parts of the continent so far east as British East Africa. The Eastern race, known to naturalists as *Boöcercus euryceros isaaci,* displays slight differences from its congener of West Africa, the chief points being a heavier and more convex skull, brighter colouring, and more massive horns. The longest horns of the East African race yet recorded measure 33¾ inches. These are from the Mau Forest, and are now in the Hon. Walter Rothschild's Museum at .Tring. The spoor of the Bongo is described by Captain C. H. Stigand as something between that of an immense bushbuck and an eland's.

From its extraordinarily shy and secluded habits, the Bongo has hitherto almost entirely defied the efforts of white sportsmen to obtain it. The few specimens of skins and horns which have hitherto reached Europe have been obtained in nearly every single instance from native hunters, who trap and snare the animals. In 1907 Lieut. H. A. Carter, of the West African Regiment, succeeded in shooting one of these antelopes, which had actually come right up to the barracks at the Batkanu Station on the Uabole River, some seventy miles north-east of Freetown, Sierra Leone. The buck charged at sight, but was luckily stopped by Mr. Carter before it could do mischief. A charge from one of these huge antelopes, armed as they are with formidable and very massive horns, must always be a dangerous one. In East Africa this antelope is found ranging in dense forest country, at an altitude of 7,000 feet, where the climate is cold, misty, and damp. In other regions its habitat is in humid jungles and forests, where the temperature is hot and stifling. It feeds mainly at night, and lying down as it does during most of the day, is for that reason very difficult to hit upon in the dark and tangled jungles in which it secretes itself. Notwithstanding its bulk and the size of its horns, the Bongo has no difficulty in making its way through the thickets. The horns are carried well laid back, so much so that, according to Captain Stigand, quite a bare patch is worn on the centre of the back by the horn tips. On the other hand, the horns are extremely useful as a protection from thorns and creepers, and, fending off as they do such impediments, greatly assist the animal in its crouching passage through the bush. The range of the Bongo, as at present ascertained, is West Africa from Sierra Leone, through Liberia and Fanti, to the Gaboon; thence, eastward, it is found in suitable forest and bush country to East Africa.

H. A. Bryden.

BOWLS.—If this ancient and historic game did not originate in England, it must have been introduced not long after the Norman conquest. Strutt, after all his researches, could only say that it was probably an invention of the middle ages, confessing his inability to ascertain the time of its introduction, but he traced it back to the thirteenth century, and in his *Sports and Pastimes* gives a copy of the earliest pictorial representation he had found. The original may now be seen in the British Museum in a MS. (20 D. IV. p. 187) in the Royal Library. It is a well-preserved coloured drawing and shows two players and two bowls and two small cones, one of the latter being placed at either side of the playing ground and evidently serving as alternate marks to bowl at. By the fourteenth century the cones had been superseded by a single small bowl, now and for ages past called "jack," as the object played at, for in a spirited drawing of that period, also copied by Strutt, we find three players with three bowls and a jack. Nowadays each player uses two or more bowls, and, allowing for changes in costume and more numerous players, the game seems to have been played in much the same way then as now.

Abundant records of the intervening centuries show the position held by the game in public estimation. During the sixteenth and seventeenth centuries and the early part of the eighteenth, it was in great favour with royalty, the nobility, clergy, and the well-to-do, but after Queen Anne's time a reaction set in, which continued down to our own day. Of recent years, however, the game has experienced a great revival, and now bids fair to attain and hold the high position it deserves as a gentle and healthful recreation.

The game was established in England long before its introduction into Scotland, where the practice of it has been modified and differs in many important respects, though the main principles and objects of play remain the same. [*See* BOWLS, SCOTTISH.] It is played upon what are called "bowling greens," grass plots of varying extent usually taking the form of a square or oblong with a width or length of from 40 to 60 yards. Such a space affords ample scope for play, a stretch of 35 or 40 yards from "trig" to "jack" being quite enough to play over, if nicety of play is to be regarded and fatigue avoided. The trig (or "footer") is an essential implement in the game, and the starting point of all play. It is usually a piece of leather or matting about 18 in. square, upon which the leading or first player places one foot when throwing off jack, which he must do to a distance of 20 yards at least, but not nearer than a yard to the edge of the green. If the first throw fails he is allowed a second, but, failing again, his opponent is entitled to one throw, and if he also fail, the throw reverts back to the first player, but the order of play is not interfered with by such failures.

The jack is sometimes made of ivory, but commonly of wood or earthenware, and is from 2½ in. to 4 in. in diameter. On some greens biassed jacks are still used, but earthenware straight-running ones are superseding them. The bowls (of which each player uses two in ordinary English play) are of globular form, and much larger and heavier than the jack. They are made of *lignum vitæ* or other hard and heavy wood, and vary in size and weight; the largest seldom exceeds in circumference the Scotch limit of 16½ in. and the average weight is about 3 lbs., but there is no *minimum* limit of size. The most peculiar and interesting feature in bowl-playing is that the bowls are purposely made with a "bias," *i.e.*, a tendency to diverge from the straight line when set running. Every bowl is practically round in the largest circumference or running part, but is shaved down very carefully and evenly on one side by the turning lathe, the effect being to cause the bowl when slackening speed to incline and turn (or draw) towards the reduced side, the divergence corresponding in intensity to the amount shaved off. Formerly the bias was brought about by inserting lead on one side of the bowl, but not so now. Perfectly straight-running bowls are not allowed, so that the player has, in sending a bowl on its journey, to allow for this created bias, the distance to jack, and the amount of force necessary to accomplish the object of his play. Inequalities in the surface of the green must also be taken into account, otherwise elevations, depressions, or slopes will inevitably tell their tale by impeding the bowl or carrying it out of the contemplated course.

THE DELIVERY.

The usual complement of players in the English game is six, who divide into two sides of three, either by choice or by drawing lots. Each side agrees upon one of their number to lead or play first, and we may call him No. 1; he is supposed to be the weakest player, and is followed by the medium player as No. 2, the rear being brought up by the most experienced and skilful player, No. 3. Nos. 1 on each side toss to see which shall lead, and the game commences by the winner throwing jack within the prescribed limits, and when it has come to rest and is in all respects a valid mark he proceeds to play one of his bowls, and is followed by No. 1 of the opposing side with one of his; they play their second balls in the same order, and Nos. 2 and 3 on either side alternately so continue the play until all the twelve bowls are played, when an "end" is said to be finished, and the side owning the bowl lying nearest jack are said to have the "cast," which reckons one point in the score, and they are allowed another point for every additional bowl of theirs which lies nearer jack than any bowl of their opponents.

The number of available players of course varies. Two may play, opposing each other in what is called "single-handed" play, or four can play, two on each side, after the same manner that six do; but the play single-handed or two of a side being more continuous and involving frequent crossing of the green, is apt to become fatiguing, especially in warm weather. If more than six play in a set, the ground in the neighbourhood of jack becomes so encumbered with bowls that the hindmost players have few openings left for their skill, and their enjoyment is correspondingly lessened.

The game does not consist merely in playing the bowls so as to rest as near jack as possible in unobstructed ground, for second or third player often finds his course obstructed by the bowls already played, and that his own can only approach by passing, sliding from, or removing one or more of them, whilst third player has additional responsibility, the final result of the "end" depending on his play. He is generally equal to the occasion, and by a well-played bowl insinuates his own or a partner's into a winning position or "saves something." His only resource often is "firing" (playing with much force) at jack or bowls or both, either to send jack off the green and so "void" the end altogether, or so to scatter the bowls as to drive away his opponents or let in one of his partners. Leading players should never be "short," *i.e.*, should not play their bowls so as to stop short of jack; to go beyond it is better, as the jack can be driven to them if desired; the second players should play "well up" unless it is advisable to "block" the ground against the opponents in order to maintain a favourable position.

It is most important that the beginner should adopt a good position and attitude for delivering his bowls. If a right-handed player, he should place his right foot firmly on trig, then advance the left about a yard, and, bending the left leg and stooping, bring his body down nearly parallel with the green, leaving just sufficient space to swing his right arm with the bowl in hand clear of the grass, so that the bowl may glide from the hand and strike the turf at the slightest possible angle, the nearer trig the better. In this position the player has complete command of the bowl, and his eye can detect any unevenness in the ground requiring allowances. A left-handed player places left foot on trig, and advances the right in the same manner. A right-handed player naturally plays on the right-hand ground, that is, to the right of an imaginary line drawn from trig to jack, and ought to play both bowls on that ground unless blocked by other bowls, when he should "change his ground" by playing to the left of the line. It becomes necessary to change the ground in many cases. For instance, your opponents may have a "short" bowl lying a little to the right of jack, and, should your bowl touch it, it may be driven nearer to jack; in such a case you play on the left-hand ground. This changing the ground is necessitated by a variety of circumstances too numerous to specify. In play the bowl should be firmly grasped in the hand, in right-handed play the little finger resting near the biassed side, and the thumb on the other side, which is called "playing finger." If the player decides to change his ground he turns the bowl in his hand and plays with the thumb on the biassed side, and this is called "playing thumb." Beginners often feel a difficulty in playing on both sides, but should never give way to the natural inclination to play only on one side; there never was a good player who did. Occasionally the green is so encumbered with bowls on both sides of the imaginary line that to succeed it is necessary to reduce the natural curve caused by the bias, and this may be done either by playing with extra force, or by "setting up" the bowl so that its circumference inclines a bit to one side or the other, a manœuvre in which some players excel.

On the completion of each "end" the players cross over and a fresh one is entered upon by the winning leader throwing jack again from trig, which is placed within one yard of the spot from which jack was taken up in the completed end; the bowls are played as before, and ends succeed each other until one or other side scores seven or any agreed number of points for game.

England has not yet a national or central association of bowling clubs, and consequently there is no uniform standard of playing rules applicable to the whole kingdom, though there are local associations of clubs in Lancashire, Yorkshire, Durham, Norfolk, Suffolk, and elsewhere, which have framed sets of rules for their respective districts. In these and other parts many clubs exist and flourish independently under their own sets of rules, but scarcely any two of them are alike in all respects. In Scotland, however, the Scottish Bowling Association has provided a set of rules which are generally acted on throughout the country. Scotland has about 35,000 players and 400 greens, with district associations for Edinburgh, Leith, Glasgow, Midlothian, &c. The number of English clubs is unknown, but there are several hundreds of them. They are very numerous in Newcastle, Manchester, Lancashire, Yorkshire, and Norfolk, and the colleges at Oxford and Cambridge have several.

The English greens are not usually so level as the Scottish, and several sets may cross each other's lines of play, so that great variety may always be had owing to the constant shifting of the play and the inequalities of the green. English players use only two bowls apiece except in the more northern districts, where three or even four are sometimes allowed. In their club matches a team of twelve players is selected and divided into four sides of three each, and in matches independent of the associations the contest is usually in two parts, the first taking place on the green of the challenged club, the second on that of the challengers. The visitors, of course, have to find out as best they can the peculiarities of each green, and must be skilful to win both out and home. If each club gets a win a deciding match is played on a neutral green. In Lancashire, however, there are never more than two of a side, and their matches are usually played single-handed, the points gained by each player being added to those gained by the other players of his party, and the club making in all the highest total of points wins. Every club has its own prize meetings, and the associations promote contests between clubs and single-handed tournaments for individual merit open to all members. The players are generally attended by lads, who pick and clean the bowls for them, receiving 1*d.* each evening from every player; in this way the players are saved much time and trouble, and their attention is not distracted from the game by doing the work themselves. Some clubs, however, dispense entirely with these "helps."

A COMPLETED HEAD.

The game is not much played in Ireland, but we hear of it as practised in some form or other in most European countries, and in the United States, Canada, South Africa, Calcutta, Kurrachee, Japan, Australia, and New Zealand (where there is a Bowling Association) it is rapidly advancing.

E. T. AYERS.

BOWLS, SCOTTISH.—Bowl-playing is one of the oldest games now practised, and statistics could very easily be produced to prove that year by year it is still growing in popularity. In the fifteenth century it was unquestionably very popular, and in the next century an Act (33 Henry 8, c. 9) was passed whereby it was declared to be an illegal pursuit, and it was further enacted that no person "by himself, factor, deputy, servant, or other shall for his or their gain, lucre, or living, keep, have, hold, occupy, exercise, or maintain any common house, alley, or place of Bowling." It was alleged that it interfered with the practice of Archery, and it was only allowed to exist in the land as a luxury and for the rich. Thus, by the same Act of Parliament, artificers, servants, &c., might play at Christmas time, and a licence might be granted to those worth over one hundred pounds per annum to keep a bowling-green for private play only. Curiously enough, this Act remained unrepealed until 1845, when by 8 and 9 Vict. cap. 109, sec. 1, "any game of mere skill, such as Bowling . . ." was declared to be quite lawful.

Long before the embargo of Henry VIII.'s parliament was removed, the game was widely popular. In the north its progress was more extended and rapid than elsewhere, and in Lancashire, Yorkshire, and Scotland it speedily obtained a hold upon the affections of the people which it keeps to this day. According to Mitchell, the first bowling-green in Scotland of which we have any account is that of Glasgow. So popular has the game now become that many corporations, notably that of Edinburgh and Newcastle-on-Tyne, have provided public bowling-greens. On these greens it is usual to make a charge of one penny an hour, and it is only necessary to mention that during the summer of 1895 no less than 57,646 pennies were collected by the Edinburgh Corporation. Queen's Park, Glasgow, is the home of Bowling in the north, and is the chosen venue for the final stages of the annual championships in connection with the Scottish Bowling Association.

The game of Bowls varies in point of detail in different parts of the country, and even its title is not always the same. According to Mitchell and all the older authorities, the correct name of the game is *Bowl-playing*, although Mitchell uses the terms Bowl-playing, Bowling, and Bowls indifferently.

The game as played in Scotland differs widely from that played in Lancashire and Yorkshire. (Southern English Bowls has been explained in the foregoing article.) The chief differences between the two games are these:—

In Scotland the greens are absolutely level, or as nearly level as skilled experts can make them; spherical earthenware jacks are used to play to; the play must be confined to the rink—that is, a space usually about seven yards wide, extending the full length of the green; the players in single and double-handed matches invariably use four bowls; and club matches are invariably played with four men a-side, as in curling, each player using two bowls.

In Lancashire each green has a "crown" varying in rise and slope, so that it is almost impossible to find any two greens alike; the jacks are of wood with bias, much the same as the bowls; the first player can throw the jack to whatever part of the green he likes, the different lines of play thus frequently crossing each other; players only use two bowls; and matches are decided by a series of single-handed games, the rink form of contest being practically unknown.

The Scottish game is gradually extending its sphere beyond Scotland, and in London, Northumberland, Cumberland, Durham, Westmorland, Ireland, Australia, and New Zealand, greens have been made and the game played as in Scotland.

Greens vary considerably in size, from thirty-five to fifty yards square being the usual extremes. Where grounds can be obtained at all, they should not be less than forty yards square, and five yards more each way is a very great advantage. That area permits of plenty of variety in the matter of length, and prevents the ends from becoming worn out, as they inevitably do when the green is so short that the mat has almost invariably to be on the same spot. In laying a green, particular care must be taken so as to ensure efficient drainage, and the turf used must be fine and wiry in substance, and such as to stand plenty of wear. Experience has taught that the turf found growing on the sand by the seashore is incomparably better than any other for a bowling-green, and so great is the demand for it that a price almost equal to the value of the freehold of the land has to be paid before a sod can be turned. For many years the Ayrshire coast was the chief source of supply, but of late that has become exhausted, and nowadays we frequently hear of turf being brought from such distant isles as Colonsay and Islay. Of course all bowling-greens must be kept closely cut and rolled; and to obtain the best results it is necessary to mow it a few times each season with a specially set scythe. An expert mower with a proper scythe will cut barrowfuls of grass after the closest-set machine can get no more; and the advantage to be obtained, both in the way of keener play and a healthier green, can only be appreciated by those who know from experience.

The aim of every player is to get his bowls—"woods," they are sometimes called—nearer to the jack than his opponent, and immense variety is afforded by "drawing," "guarding" a shot or a road, "trailing" a jack to alter the position of an end, "striking" to remove an opponent or clear the way, and so on.

Up to a few years ago there was no recognised central authority on the Scotch game, but in 1891 one of the best bowlers in the north, Mr. James Brown, acting upon a suggestion dropped by the present writer, founded the Scottish Bowling Association. Already it has organised a couple of championships each season, one for single-handed play, and the other for rinks, and the prizes offered are looked upon as the highest honours in the Bowling world. In Scotland all inter-association, inter-county, and inter-club matches are played in rinks, but at tournaments the play is almost invariably single-handed, although there are occasionally some for "pairs," and there is also the Association rink contest. Never a season passes but several tournaments take place, and at some of the larger meetings it is not uncommon to find more than five hundred entries, and the play extending over the best part of a month. It remains to add that the present practice of giving money-prizes is being opposed by an ever-increasing host of bowlers, who warmly approve of the strictly amateur position taken up by the Association.

J. B. LITTLE.

MEASURING THE DISTANCES FROM THE JACK.

BOWLING.—"Booling with bouls," as it is pronounced by Northumbrians, is played on a course whose length varies from 1,150 yards to one mile. The object is to cover the course in the fewest possible throws. For each throw a short run may be taken up to the "trig," which is a line fixed by the referees at right angles to the course, at the point where the ball last fell. The length of the trig is about two yards. The arm may be swung completely round before the bowl leaves the hand in the final lurch. The weight of the balls, which are mostly of stone, sometimes of concrete, varies from 3 oz. to 50 oz. Weights are, of course, specified before a match. Where the players are to be handicapped, the heavier balls are given to the better players.

In Newcastle the game is played largely by pitmen on the Town Moor, which consists of 927 acres of undulating grass land. Saturday afternoon is, naturally, a favourite time. Another Northumbrian course is at

Newbiggin. The knots of pitmen who play it are extraordinarily keen and excited over it, and it is well not to balk them by ill-timed crossing of the course.

RULES.

The Game of Bowls as played by the Norfolk and Suffolk Bowling Association.

1. No player shall change his bowls after commencing a game, unless with his opponents' consent. The circumference of a bowl not to exceed 16½ in.

2. On commencing a game, the footer must be placed by the leader before he throws the jack.

3. On changing ends, the leader, before he throws the jack, must place footer within one yard of the spot previously occupied by the jack, and from thence play must be resumed.

4. The footer must not be taken up until the last bowl has been played. If the footer has been taken up, and the last bowl by reason of a rub or set, has to be played again, it must be replaced as nearly as possible in its former position.

5. If the jack is struck off the green, the footer must be placed one yard from the edge opposite to where it had been struck; but if half the bwols have not been played, they must be returned, and play resumed from where the footer lay.

6. If the player who has to throw the jack fails in two trials to throw a mark, one of the opponents must then throw it. The defaulter (not the thrower) must play the first bowl. If the opponent at one trial fails to throw a mark, the defaulter again takes the lead.

7. If the jack in its course be impeded in any way, or stops on the land of any other players, it must be removed or thrown again.

8. If two jacks are thrown near the same place, the one that is last stationary must be pronounced not a mark, and must be removed or thrown again.

9. If a bowl be played before the jack is at rest, it must be taken off the green.

10. If a played bowl has reached its destination before the jack is pronounced not a mark, the end proceeds.

11. The jack must not be thrown so as to stop near the centre of the green and obstruct other players.

12. A jack, if delivered a yard from the boundary of the green, must not be played along the edge of the green, so as to rest at the same distance from the boundary. If the jack is at rest four yards from the edge, in a line with its course, it is a mark. A jack delivered four yards from the edge may rest at a distance of one yard.

13. The player on delivering a bowl must place his right or left toe on the footer, according as he plays with his right or left hand. Any bowl not so played may be stopped and played again. Any bowl not so played a second time, must be taken off the green.

14. A player after delivering a bowl must not follow it up in such a manner as to impede the sight of his opponent; if, after being cautioned, he persist in doing so, the opponents shall have the option of playing out the end, or declaring it void.

15. If a bowl be played out of turn, it may be stopped by an opponent; or, at his request, be played again in its proper turn; if, however, it has reached its destination, it must remain, and the opponent may play two bowls in succession if he has them.

16. If an opponent's bowl be played by mistake, it may be stopped; but if it has reached its destination, it must be replaced by the right bowl if requested.

17. If a bowl be played whilst the preceding one is in motion, it becomes a dead bowl.

18. A player may retain possession of the footer until his bowl has ceased running.

19. Players, when at the end where the jack lies, must not stand within the radius of the bowls as they are played, or directly behind the jack, so as to obstruct the sight of the other players.

20. When an end is finished, neither the jack nor a bowl that scores must be removed (unless with the consent of an opponent) until the casts are all counted and the players satisfied; otherwise the end may be declared void.

21. A person may be chosen to keep the score and declare it at each end; but if no scorer be chosen, the leader, before he throws the jack, must declare the state of the game by pronouncing his own score first, and loud enough to be heard by his opponents.

22. If a running bowl be impeded by an opponent, or any other cause, before it reaches the jack, it must be played again; but if impeded by the player or his partner, it must be taken off the green.

23. If a running bowl be impeded by the player or his partner, after passing the jack, it must be taken off the green; but if impeded by an opponent, or a bowl of the player's, it must remain where it stops.

24. If a still bowl be displaced by an opponent, or any other person, or by a bowl or a jack of any other players, it must be replaced as nearly as possible in its original position.

25. If a player touch or displace a still bowl of his own or his partner, it must be taken off the green.

26. If a player take up or remove one of his own, his partner's, or an opponent's bowl, to give himself or partner an advantage in play, he forfeits the game.

27. Before delivering a bowl, a player or his partner, on obtaining permission, may remove a bowl belonging to any other foreign set of players, if it obstructs his play, or they may take it up to prevent a running bowl of their own (but not an opponent) striking it.

28. If the jack is displaced by a bowl or the jack of any other players, or by any exterior cause, or taken up by one of the players whose bowl was nearest to it, before the last bowl is played, the end is void.

29. A player may block an opponent at hand whenever he thinks proper, but he must not play his bowl a less distance than four yards from the footer. The bowl must be played, for, if placed, it becomes a dead bowl.

30. If a player strike the jack with his bowl, and the jack rub or hit his partner, or any other person, or a bowl or the jack of any other players, the end is void; but if it rub or set on a bowl of the player's, it must remain where it stops, and the bowl nearest to it (when the end is finished) scores first cast.

31. Whenever the jack is struck off the green the end is void.

32. If a player touch the jack for the purpose of claiming the game, before the opponents have played their last bowl, or before he has a sufficient number of casts to win, the end is void.

33. The jack must not be turned, but may be touched gently with the finger.

34. If the last player and his partner have a sufficient number of casts laid to win the game, he may decline playing his bowl, or he may re-

quest his partner to touch the jack; and if, by then playing, he change the position of the jack or bowls, it does not alter the game.

35. If he play his bowl without the jack being touched, it must not be stopped or the jack touched; and if the position of the jack or bowls is changed, and the casts reduced to less than will make the game, or if he set an opponent's bowl first, it scores, and the game proceeds.

36. If a bowl so played be stopped, or the jack touched by the player or the partner, the end is void.

37. When it is doubtful which bowl is nearest the jack, it must be decided by a standard, if the distance is less than a yard. After the standard is taken by the leader or his partner, the bowl must be removed; then, if the opponents can make it rest on their bowl and the jack, they win the cast.

38. Whenever a bowl rests against another, and the bowl rested against has to be removed to allow the other to be measured from the point nearest the jack, it must be removed by an opponent or a disinterested person, and measured as it settles after such removal.

39. No measuring is to be permitted until the end is finished.

40. A player may instruct his partner, but he must not stand or place any object between him and the jack for the purpose of indicating the land to be taken when he is in the act of playing, neither must he point out to his partner how their opponents' bowls lie, but he may point out their own or request him to inspect their position before playing.

41. Bowls played or struck off the green, or prevented going off by resting against anything at the edge or in the channel, must not be scored.

42. If, during the course of the game, it becomes so dark that the jack cannot be distinctly seen from the footer, any player may have a light exhibited at the jack if he so request.

43. Spectators are not permitted to instruct, or give any intimation whatever to players, and are amenable equally with the players to the rules of the green and the game.

44. No persons, other than players, are allowed on the green, except measurers, at such times as their services are required, and dogs are not to be brought on the green by any person.

45. No bowl to count that is more than 6 ft. from jack.

46. If a bowl be carried by the player four yards from the footer, the bowl to be forfeited.

Note.—The rules of the game vary considerably in different parts, but the foregoing may be accepted as generally typical.

Glossary.

Alley.—Properly a covered green, but sometimes used for any ground on which the game is played.

Auld-bowl.—The bowl lying nearest the jack. Sometimes called Cast-bowl.

Baby.—[*See* Jack.]

Back-hand or Cross-hand.—The left-hand side of a right-hand player and *vice versa*. Used also in description of a throw when the hand is across the body at the moment of delivery and the bias on the right side of the bowl.

Bares.—The old name for *Greens*.

Blocking.—(Also **Guarding** and **Obstructing.**) Playing a bowl so that it shall come to rest between the next player and the jack, or any bowl at which he may wish to aim.

Burned.—The jack, or bowl, is said to be "burned" when touched, accidentally or deliberately, by any player, or spectator after coming to rest. If by the former, the opposing side choose whether they will begin the "End" (*q.v.*) again or not, but if by the latter, it *must* be recommenced.

Cast.—The unit of scoring; a ball lying within 6 ft. of the jack and nearer to it than any opponent.

Charging.—[*See* Firing.]

Cot.—[*See* Jack.]

Cote.—A sliding touch upon another bowl. [*See* Kiss.]

Cross-hand.—[*See* Back-hand.]

Dead length.—A bowl stopping exactly on a level with the jack.

Dead bowl.—A bowl which is out of the game because:—

(1) It did not travel three yards from the "footer" (*q.v.*);

(2) It travelled off the ground, or

(3) It was moved by its owner or a partner.

Directors.—The captains of sides; also called **Drivers** and **Skips.**

Ditchers.—Bowls that at the first cast, or in the subsequent play, are driven off the green.

Drawing.—Playing slowly up to an unobstructed jack, so as to rest close by it. In Scotland, placing a bowl a little beyond jack in the direction in which it is expected to be driven.

Drivers.—The last players of a side, and usually the captains. [*See* Directors.]

Duggler.—A bowl at rest touching the jack.

End.—One delivery of all the bowls upon the two sides, after which the jack is again "set." Also called **Head.**

Firing.—Sending the bowl with great force in order to carry away the jack or an opponent's bowl: or to disarrange the mass upon the chance of improvement. In Scotland it is known as **Riding.**

Footer.—The square cloth or mat set by the place from which the jack was thrown. Each player must have one foot upon it at the moment of delivery. Also known as **Trig.** [*See* Hob.]

Fore-hand (also **Open-hand**).—The right-hand side of a right-hand player and *vice versa*. Used in description of a shot in such direction, with the bias on the left side of the bowl.

Green.—The level grass surface upon which the game is played. It should be not less than forty yards square.

Guarding.—[*See* Blocking.]

Head.—[*See* End.]

Hob.—The straight stick formerly used instead of the "footer" (*q.v.*). Each player must have one foot behind it when delivering the bowl.

Jack.—The object at which all the bowls are aimed. It is usually turned from light-coloured wood, or from darker wood and painted white. Not infrequently, it is made of white earthenware; the diameter should be within the limits of 3¼ and 3¾ in. Sometimes called **Cot** or **Baby.**

Kiss.—[*See* Cote.]

Land.—A local expression for the ground over which the ball is to travel (*e.g.*, "Come this land.")

Lead.—To throw the jack for a "mark" (*q.v.*).

Leaders.—The first players upon a side.

Lurch Game.—A game in which one side has scored five before the other has scored one.

Mark.—A "mark" is *set, thrown*, or *led*, by the winners of an end after the score has been settled. It is obtained by throwing the jack, which should run not less than twenty and not more than forty yards from the footer.

Marred.—If a bowl or jack in motion is impeded or has its course altered by any obstacle other than a bowl in play, it is said to be marred. If the jack be marred by a foreign article, or by a partner of the striker, the end is void, but if by an opponent, the striker may take his choice. If a running bowl be marred by the player or his partner, it is dead, and must be taken off the green; if by an opponent after passing the jack, the player may have his throw again, or may put the bowl where it would have gone; if by an opponent before passing the jack, he must have his throw again.

Narrow throw.—A throw in which insufficient allowance has been made for bias.

Nutmegs.—Very small bowls.

Obstructing.—[*See* BLOCKING.]

Odd.—Extra bowls played by a member of the side fewer in number to make the total throws equal.

Open-hand.—[*See* FORE-HAND.]

Over.—A throw which goes past the jack.

Play-finger.—To deliver the bowl with the little finger resting on its inner or smaller side.

Play-thumb.—To deliver the bowl with the thumb resting on its inner or smaller side.

Points.—The unit of scoring [*See* CAST.] The number required for a game varies according to agreement. Generally the total is from seven to eleven, but in matches sometimes as high as twenty-one.

Raking.—Scottish for "Stiff-drawing" (*q.v.*).

Riding.—Scottish for "Firing" (*q.v.*).

Rink.—(1) A narrow section of a bowling-green, some 20 ft. in breadth, taken by one party for their game. (2) All the players upon the two sides. (Both terms are more common in Scotland than England.)

Rub.—Any obstruction to the bowl's course from inequalities of the ground or natural obstacles; also used of a running bowl sidling from another.

Score.—[*See* POINTS.]

Short bowl.—One that does not reach the jack.

Side.—Varies in number. In Scotland usually four, and in East Anglia three. In the north of England single matches are common. There are rarely more than four.

Skip.—[*See* DIRECTORS.]

Skittling.—"Firing" (*q.v.*) without judgment and without necessity.

Standard.—The light reed or cane usually employed to measure the distance between rival bowls and the jack. It is only used up to one yard. The reed is shortened until it will no longer rest upon the first tested bowl and the jack. If it can then be made to rest upon the second and the jack, the latter wins the cast.

Stiff drawing.—Playing with such strength as to move the jack a few yards onwards, or to push out another bowl. It shades into "Firing."

Still bowl.—A bowl at rest.

Through the house.—A delivery that goes through a mass of bowls without touching any.

Trig.—[*See* FOOTER.]

Turning the jack.—"Means a player doing any palpable act to indicate that he claims the game to be up as the bowls then lie, and his opponent allowing the claim. The only period at which this can be done is when the claimant or his partner has one bowl to deliver after all the bowls of the opposite side have been played."—ROYLE.

Void end.—A round which does not count anything to either side owing to some accident, *e.g.*, the jack knocked off the green, or interfered with by a spectator.

Welshman.—A handicap match. Adopted from Cock-Fighting.

Wide throw.—A delivery which allows too much for the bias.

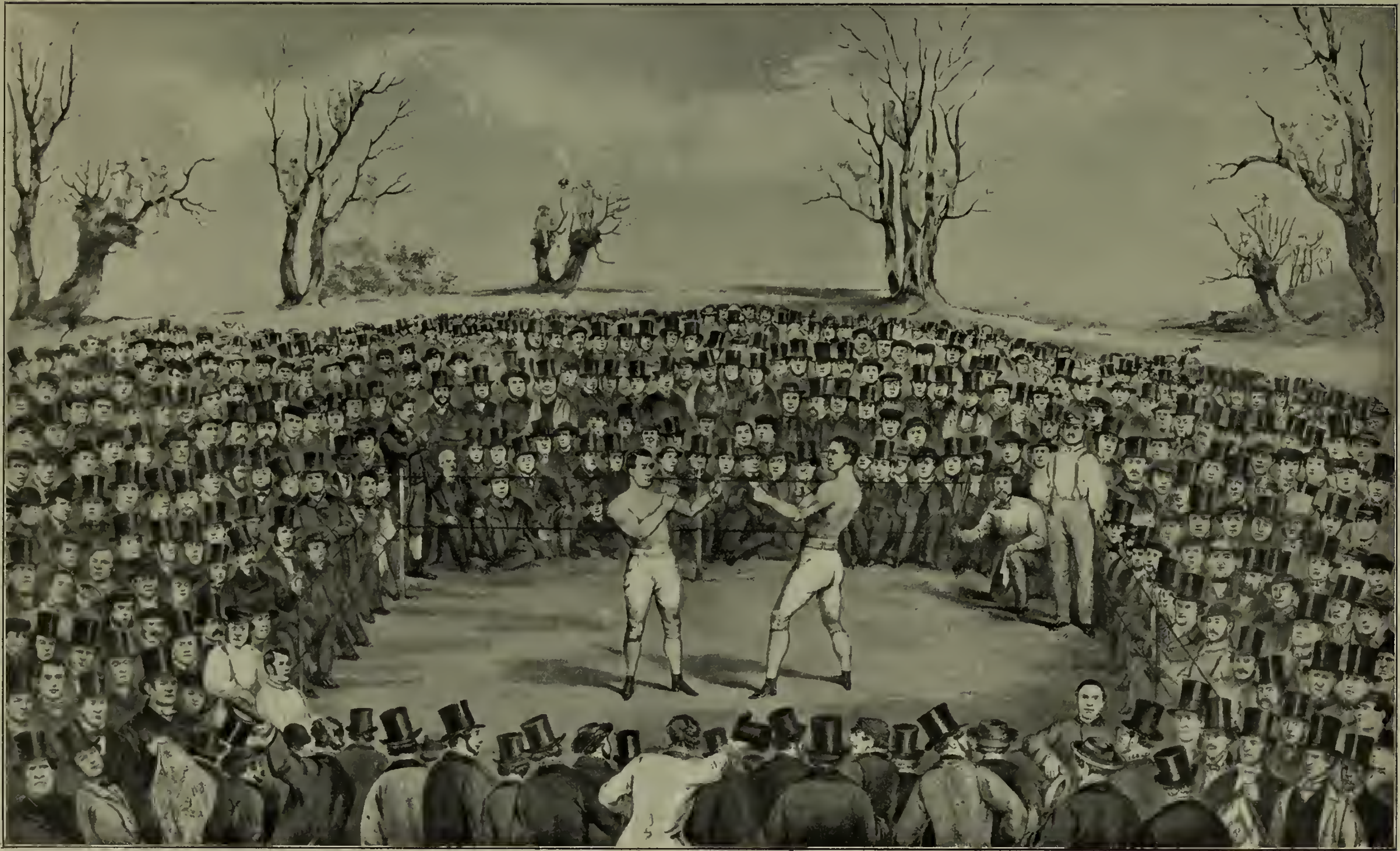
Woods.—Another term for the bowls. The jack is said to be "wooded" when surrounded by bowls.

BOXING.—This art, of great antiquity and undoubted usefulness, whether looked upon as a most interesting and perfect branch of gymnastics or as a means of defence which supersedes the use of artificial weapons, has always been held in high regard in England; and, notwithstanding the decay of the prize-ring as an institution, probably at no period in the history of the country was the "noble art of self-defence" in greater vogue than it is at the present time.

Boxing, in this country at all events (for in what is called "la boxe française" the use of the foot as a weapon is admitted and encouraged), consists essentially in striking with the closed hand or fist, covered for purposes of practice with the boxing glove of soft leather, stuffed with horse-hair, to act as a necessary buffer between the face and the attacking knuckles.

There has grown up, round what would appear to the uninstructed mind a simple matter, a very complicated and artistic system of attack and defence, subject to such rigid prescriptions as shall insure immunity from brutality and unfairness. An extraordinary development of glove-fighting has been seen of late years, and, instead of the old battles with bare knuckles which were so frequent in the early Victorian age, we have seen that a great deal of encouragement, pecuniary and social, has been bestowed upon glove contests between professional exponents of the art.

Whether this has resulted, as might at first sight have been expected, in an increase of scientific development as distinguished from mere endurance and power of giving as well as receiving punishment, or whether something has not been sacrificed in the way of general efficiency to the desire to terminate a contest abruptly by a "knock out," is a question which requires some consideration. It is certain that the majority of boxing matches in the present day are so terminated, whereas in the old days of knuckle-fighting, the days of the Fives-court, Nat Langham's, Jem Shaw's, Bill Richardson's, and other well-known resorts of the old-fashioned fighting man and his patrons, this seldom occurred; and the fact may be attributed, we cannot but think, to their "shaping" in the manner we shall endeavour to describe when treating of position, and to the jealous care with



By kind permission of F. R. Scofield, Brixton.

Jem Ward's Picture of the Fight between Sayers and Heenan at Farnborough in 1861.

which a straight use of the left-hand was taught and practised. The object now seems to be in too many instances to endeavour by hook hits and round half-arm hitting to "send to sleep" an antagonist as soon as possible, risking in the process the reception of hits which, if made with the bare knuckles, could not but stop the most thorough "glutton" for punishment.

An example of the brilliant and successful use of the straight left against these attempts is to be found in the case of an accomplished coloured boxer, Peter Jackson, whose style shows more of the old form than that of most of his colleagues. It is a notable fact, upon which we may perhaps be allowed to congratulate ourselves without being charged with too much chauvinism, that England and her colonies, notably Australia, have produced so many able exponents of the art of boxing, and that the majority are of Anglo-Saxon or Hibernian blood, whether hailing from this country or the United States; and that several boxers of eminence from the last-named country have to acknowledge the United Kingdom as their native home.

The general enthusiasm for the art of self-defence has spread from the civil population to the military forces, and there is something very remarkable in the rapid strides that have been made of late years in this direction in the army, the navy also, as might be expected when anything combative is toward, being well in evidence. The Brigade of Guards some four years ago showed the way by engaging efficient instructors, and now, thanks partly to this good example, at such great military centres as Woolwich, Chatham, Aldershot, Portsmouth, and the London barracks, regimental and garrison competitions are held each winter, and an annual championship meeting takes place at Aldershot. That this manly and healthy sport possesses the sanction and good-will of the higher authorities is shown by the fact that a former commander-in-chief, Lord Wolseley, stated when presenting the prizes at Chelsea Barracks, that he hoped that boxing would very soon form part of every soldier's education. We can only wonder that the authorities at Scotland Yard and the chiefs of police throughout the country have not insisted upon instruction in boxing forming a part of every policeman's education. The time is probably not far distant when this will be the case, no doubt to the great advantage of a fine set of men who have very arduous and dangerous duties to perform with an equipment of arms much inferior to that used by any other police force in the world. Even if they use the comparatively inefficient weapon which they carry, the truncheon, except in circumstances of the greatest pressure, they have to run the risk of severe censure.

We have said that the English race, using the term in its widest sense, appears undoubtedly to possess a marked pre-eminence in the theory and practice of the "noble art of self-defence"; but let us caution the aspirant, proud in the confidence of youth and strength, and flushed with a sense of racial predisposition, that skill in boxing does not come by the light of nature; and that, if he desire to use his natural weapons to the best advantage, he will be well advised in seeking the tuition of some accredited master. It is only by assiduous practice and imitation of well-chosen examples that proficiency is to be attained in what is a highly complicated and scientific sport.

None of the arts of defence can be learned from books, though books may be useful as adjuncts to practical demonstration, in fixing principles, maintaining what is of value in tradition, and furnishing useful hints and necessary cautions.

This being premised, we will endeavour to explain as succinctly as possible those different positions, leads-off, counters, guards, stops, and means of avoiding hits by ducking, slipping, and getting away which experience has taught to be most useful.

We shall adopt the following classification:—

Position—Getting About and Breaking Ground—Lead-off at Head with Left Hand—Guard for Lead-off at Head with Left Hand—Guard with Right Hand and Counter with Left Hand—Lead-off and Guard Left-hand Counter—Counter at Body with Left Hand—Counter at Body with Right Hand—Lead-off with Left Hand and Duck—Left-hand Lead at the Body—Guard for Left-hand Lead at the Body—Stop for Left-hand Lead at the Body—The Upper Cut—Double Hit at Body and Head with Left Hand—Guard for above—Right-hand Cross-Counter—Stop for Right-hand Cross-Counter— Feints— Draws— Ducking—Slipping—In-Fighting.

Position.—Place the left foot in front, pointing straight towards your opponent, the left knee slightly bent, and foot flat on the ground, the right foot about once its own length in rear of the left, with the toes slightly turned to the right, but not nearly so much as to form a right angle with the left foot, the ball of the right foot on a line with the heel of the left, the right heel slightly off the ground, the weight being chiefly on the ball of the right foot.

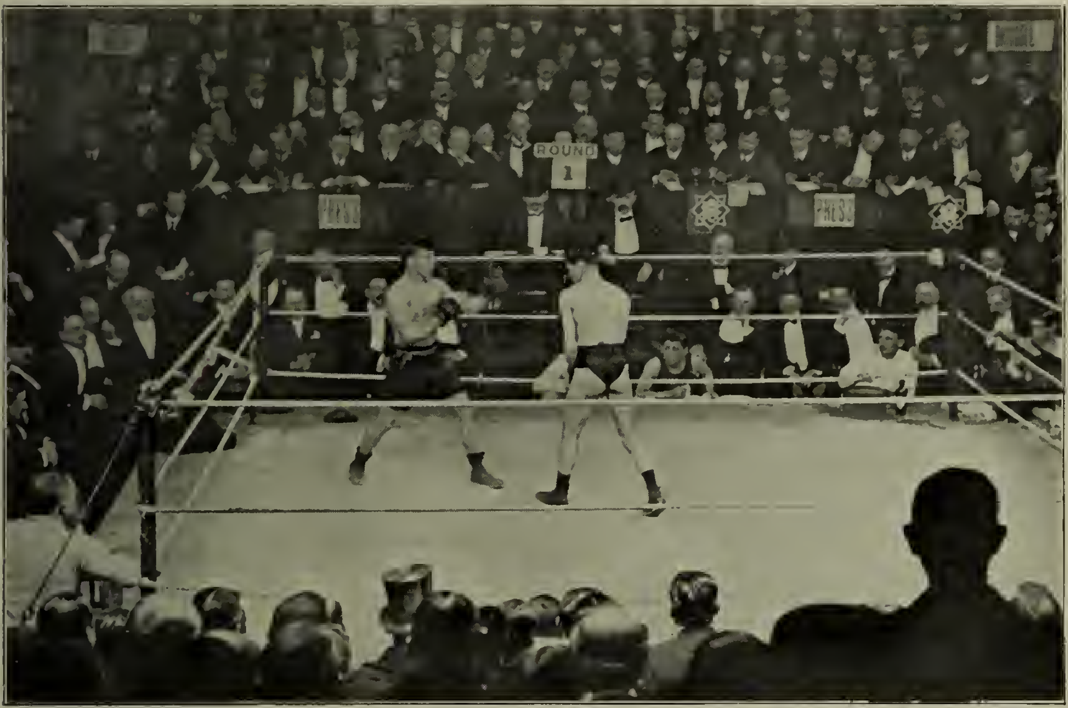
The body is turned three-quarters towards your opponent, the head being slightly inclined to the right and not presented full-face, but in such a manner that you maintain your view of your opponent chiefly with the left eye. This position diminishes greatly the chance of the point of the jaw, the mark for the right-hand cross-counter, being reached.

The right hand and fore-arm are to be placed across the lower part of the chest, nearly horizontally, so as to cover that part of the pit of the chest which is known as "the mark." This is a point of major importance, as a severe punch in this part is both painful and disabling, and if unchecked might bring a friendly sparring match to an abrupt end.

The left hand and fore-arm are to be held horizontally on a level with the elbow, so that arm and fore-arm form a right angle, the hand pointed towards the opponent, the elbow kept close to the side.

Let the shoulders be well kept down, the right slightly lower than the left. Stand easily and avoid any fixing or tightening of the muscles; let your whole attitude be free and unconstrained; a great deal depends upon the suddenness of the attack, and, if the muscles are rigidly strained, quickness and ease are rendered impossible. This, however, will be better seen when we come to consider the next point.

Getting About and Breaking Ground.—The beginner, being placed in proper preliminary position, or "on guard," must now be taught to shift his ground in accordance with the varying needs of the situation. Let it be impressed upon him that the relative position of the feet is to be rigorously maintained, except in the case of some attacks and counters, to be described in due course, after the delivery of which he immediately returns to the original position.



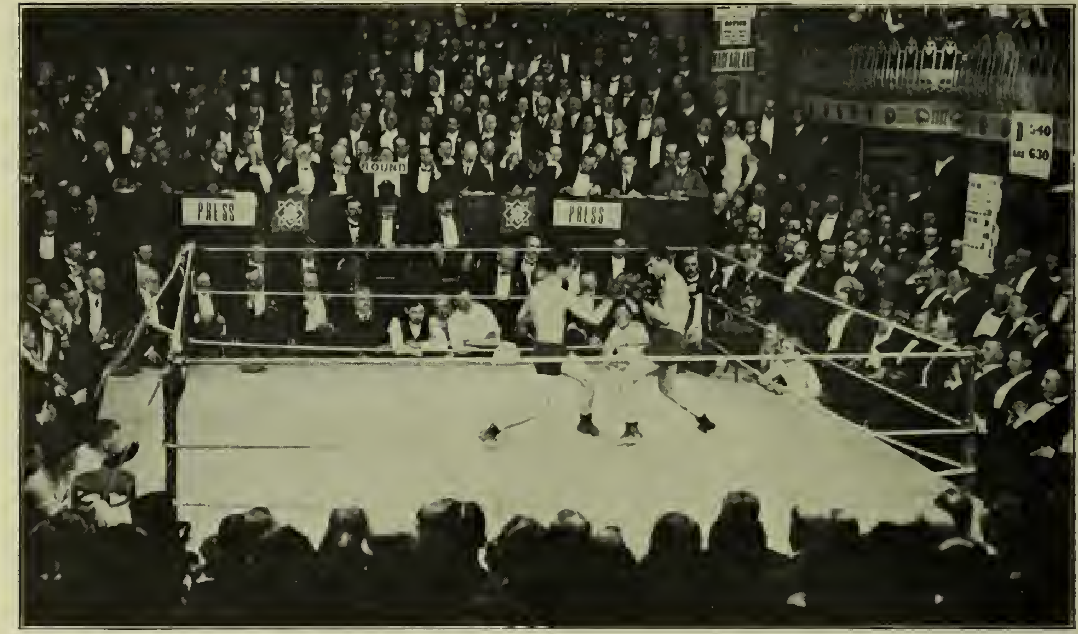
A MATCH BETWEEN DRISCOLL AND HAYES.

This position, which undergoes some slight alteration in accordance with the idiosyncrasies of various teachers, is, in the main, the best as a point of departure for attack or defence, the left hand being ready for immediate use in leading-off or countering, the right hand guaranteeing the most vulnerable portions of the body, ready to guard the head and mark, and held as a crushing reserve to be used when opportunity presents itself.

To Advance, the pupil is taught to step forward about the length of his own foot with the left foot, the distance traversed being naturally regulated by his length of limb, the left heel being distinctly the first portion of the foot to touch the ground, and to follow it up smartly with the right foot.

In Getting Back, the right foot is moved to the rear, about the above-named distance, followed by the left foot. In this and the preceding case the distance between the feet and their relative positions are to be carefully maintained.

Boxers are in the habit of circling round each other, or in other words "breaking ground" either to right or left, but the beginner is to be taught that breaking ground to the *right* is safer, as by that means he keeps out of danger of his adversary's right hand, and his feet are less likely to be crossed, a thing which might be disastrous to the combatant if attacked when in that position.



WELSH AND MACFARLAND AT THE NATIONAL SPORTING CLUB.

To Break Ground to the Right, the boxer steps about twelve inches to the right with the right foot and immediately places the left foot in position in front of it.

To Break Ground to the Left, he steps to the left with the left foot, and without loss of time, places his right in position in rear of it; but this mode of procedure, as stated above, is considered fraught with danger, and must be used with caution.

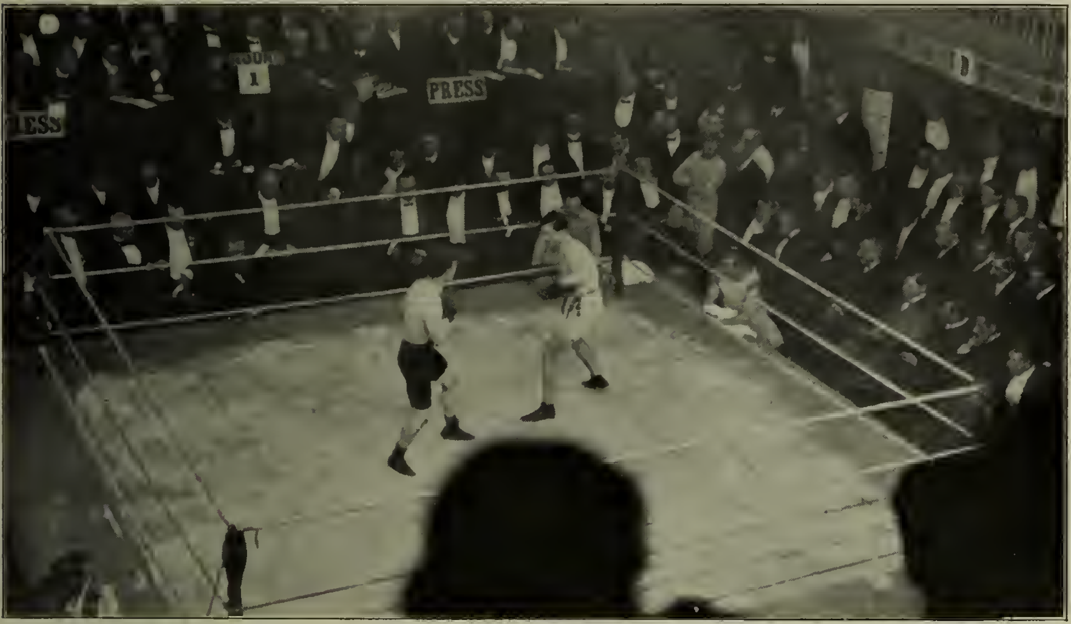
Sometimes the boxer may jump back with both feet off the ground at once, taking care to maintain the proper position. This jump may be repeated when hard pressed and when there is sufficient floor room. When out of distance, the left hand may be dropped to ease it, but when within distance it must immediately be brought up to the proper position.

The beginner must be taught to get about easily and lightly, moving his feet smartly and retaining his balance and the proper distance and relative position of the feet. The hands are not to be kept immovably in the attitude described, but to move easily backwards and forwards in unison with the movements of the feet.

Lead-off at the Head with the Left Hand.—This is the most frequent and the most useful and safe of all attacks, and upon its proper execution, smart and quick, with the weight of the body assisting the force of the blow, must the whole system of sparring be founded. It must be made with quickness and determination, otherwise the task of your adversary in countering is rendered dangerously easy.

Step in, in the manner described for the advance, striking with the left hand at your adversary's head, letting hand, body, and foot work simultaneonsly with as much rapidity as you can possibly command. Take care that the left hand and elbow are in proper position; at the beginning of the attack, the left elbow is to be close to the side, and the hand is to be shot out smartly with the palm slightly upward, so that the knuckles will be the part to come into contact with the face.

Your left foot should touch the ground at the same time as your hand reaches your opponent's face, and should bear most of the weight, the right foot resting lightly on the ground. Take care that, in stepping in with the left foot, the heel is distinctly the first portion of the foot to touch the ground, and that the foot points straight towards your antagonist, as the hand will instinctively follow the direction of the foot. Immediately after the delivery of your attack step smartly back, your left hand in position to meet any emergency. If hard pressed you may spring back, both feet off the ground at once.



The Match between Britt and Summers for the Light-weight Championship.

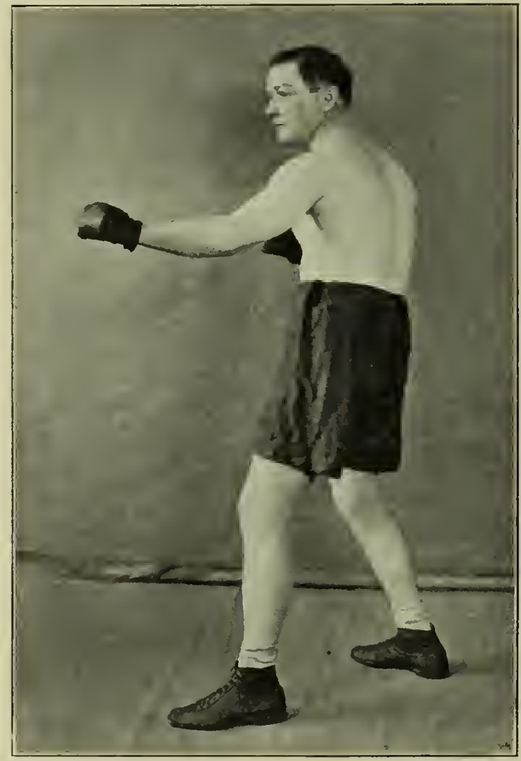
It may here be pointed out that the boxer must in all cases hit with that part of the glove which covers the knuckles, and not with the point or the inside of the glove; striking with the inside, or "heel of the glove" as it is sometimes called, would entail disqualification in competitions, and hitting or flicking with the point of the glove is an attempt to gain reach at the expense of all efficiency.

Hits are to be directed at the head and face and any part of the body above the belt.

Guard for Left-hand Lead-off at the Head.—Raise the right hand in front of the left side of the forehead, half extend the arm, and maintain your view of your opponent over your right fore-arm, keeping the elbow down and the palm of the hand outwards. You will find that in this position you get a pad of muscle before the bones of the fore-arm which will break the force of the blow considerably. Whilst this attack and guard are being practised, as they should be, assiduously, so as to make them a good basis of departure for the other movements, care should be taken that the eyes are kept open (a matter not always so easy as it would seem) and fixed upon the adversary, so that no movement of his may be lost, and that the mouth is kept shut. A blow upon the partially unclosed jaw shakes it terribly, and might even dislocate it. The hands must not be kept constantly clenched, which would only fatigue the muscles and cause slowness and stiffness. In getting about or sparring round, in what is known as "out-fighting," the hands are to be kept partly open, and are to be firmly closed on the delivery of a blow and, in some instances, on the formation of a guard. The left-hand lead-off at the head may be met in other ways to be described in due course—as by the left-hand counter at the head, or left-hand counter at the body with a duck to the right, or by the right-hand counter at the body with a duck to the left, or by that most effective of manœuvres, though difficult of execution, the right-hand cross-counter.

Guard and Counter with Left Hand on the Lead-off at the Head with the Left.—Form your head-guard as before described with the right hand, and strike out at your adversary's face with your left at the same moment of time. The position of the left hand and arm is precisely the same as in the lead-off, but the movement of the feet is different: you will keep the right foot firmly fixed on the ground and step forward with the left about once its own length. You here combine the two movements of guard and return, and must be careful to time them accurately and start at the same time as your opponent.

Lead-off and Guard the Counter.—Should you anticipate that your opponent will counter at your head with his left on your lead-off, you will, as you lead off, guard with your right hand.



Position.

Counter at Body with Left Hand.—Step in with the left foot inside your opponent's, the ball of your foot coming on a line with that of his, keeping your right foot in place, firmly fixed on the ground, and helping the forward impetus of the body as in a fencing lunge. Incline body and head well to the right so that his hand in the lead-off may pass harmlessly over your left shoulder and hit with the left hand at the mark, hand and foot working together. The palm of the hand is to be turned downwards. Here we have an example of that other position of the feet to which we have referred at the beginning of the article, and great care should be taken that the movement is correctly executed, and that the body is brought forward and downward as well as to one side sufficiently to bring the head out of danger without risking the loss of balance.

This movement has a certain kinship with a lunge in fencing, but will be seen to differ in material particulars. It constitutes what is termed a "Duck," and we shall have frequent need to refer to it.

Counter at Body with Right Hand.—To counter with the right hand at the body, bend the body and incline it and the head to the left, step forward in the same way as before with your left foot, the heel of the right off the ground, bring forward your right shoulder, and hit with the right hand slightly below the heart, the palm of the hand turned down, keeping the left hand in position.

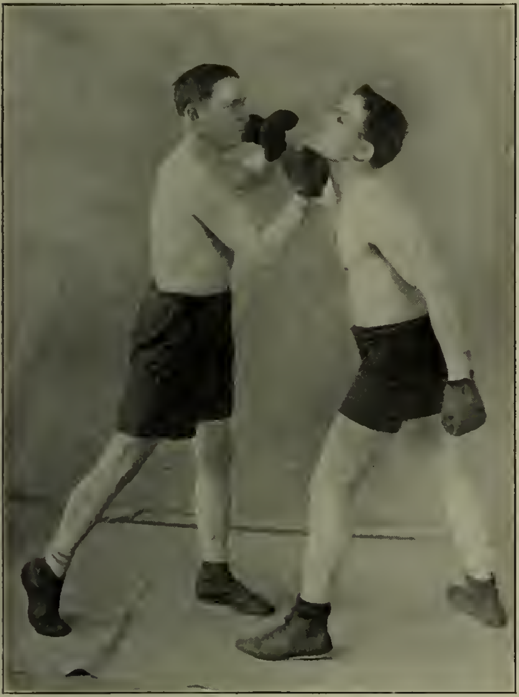
There is no possibility of stopping the right-hand counter at the body when leading off with the left hand at the head, if the counter is aimed at the spot directed (just below the heart), your right arm, which protects the mark, not reaching sufficiently far to stop this blow, and your left arm being placed by its movement of attack in an impossible position for guarding.

Lead-off at Head with Left Hand and Duck.—Lead-off at the head with the left hand, retaining your hold of the ground with your right foot as in the case last described, incline body and head to the right (duck) so as to allow your opponent's fist, should he counter, to pass over your left shoulder. The palm of the hand is to be slightly downward at the time of delivery. The right hand is to be kept in position over the mark.

Lead-off at Body with the Left Hand.—This is made in the same manner as the preceding attack, with the right foot fixed. The duck is to the right in this instance. The blow is delivered at the mark. The knuckles are turned up (palm downwards), the elbow slightly inclined outward. After the blow is delivered you are to spring back well out of distance. It will be observed that all these attacks with ducks bring you much nearer to your opponent than the left-hand lead-off at the head, and there is increased necessity for smartness in getting away to avoid what is known as an upper cut, to be described presently.

Guard for the Above.—This is guarded by the right arm, simply kept in its original position across the body, carefully and efficiently covering the mark.

Stop for Lead-off at Body with the Left.—Immediately your opponent commences to move, if you are able to judge his intentions correctly, which practice will enable you to do, counter straight at his head with your left hand. This will effectually check the completion of his attack, and form what is very aptly termed a "stop." It is, in fact, a time hit, and, if delivered with judgment, is an exceedingly effectual and pretty manœuvre.



Stopping Right-hand Hook for the Head and Countering with Right-hand Upper-cut to the Chin.

Should you not have attempted to stop him upon his attack, you can guard it in the ordinary way with your right hand, and before he has time to spring back out of reach, upper cut him with the left hand.

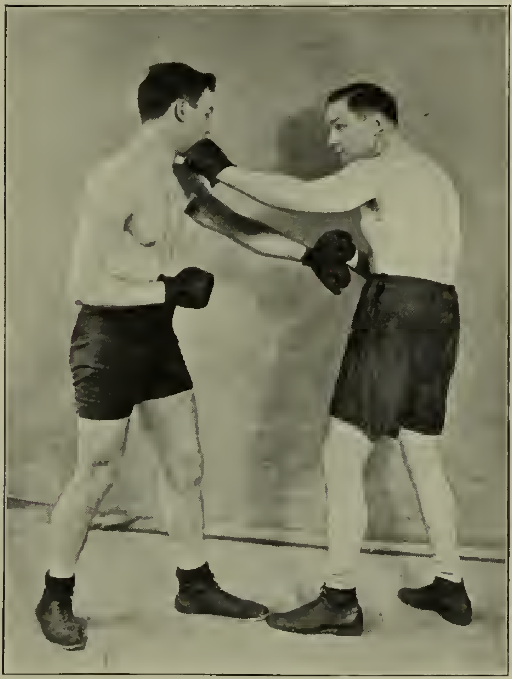
The Upper Cut, as its name implies, is a hit delivered in an upward direction with either hand, with the arm bent and the elbow kept down. As your adversary is brought close to you by his movement of attack, there is neither need nor opportunity for you to advance on him; but the blow can be swung upward with great force, every muscle in the body seeming to aid its impetus; and if the right time is seized, the position of your opponent's head and body will insure his getting its full force.

This very useful hit may be used as a counter under several circumstances, especially upon your adversary's leading off with the right hand at the body (a practice not to be recommended), or, upon his leading off at the head with either hand, holding his own head down. Form a body guard with the left arm, or a head guard with the same, according to the circumstances of the attack, and cut upwards at your opponent's face with the right hand, the arm bent and elbow down. In case of a wild and ill-judged rush on your opponent's part, with head down and arms flapping wildly like the sails of a windmill, the upper cut may advantageously be administered with either hand according to the position of his head, and will probably have a markedly deterring effect.

It may be well here to notice that methods are taught by skilful professors for "drawing" these upper cuts, and for dealing with them when so drawn by various movements of great practical interest.

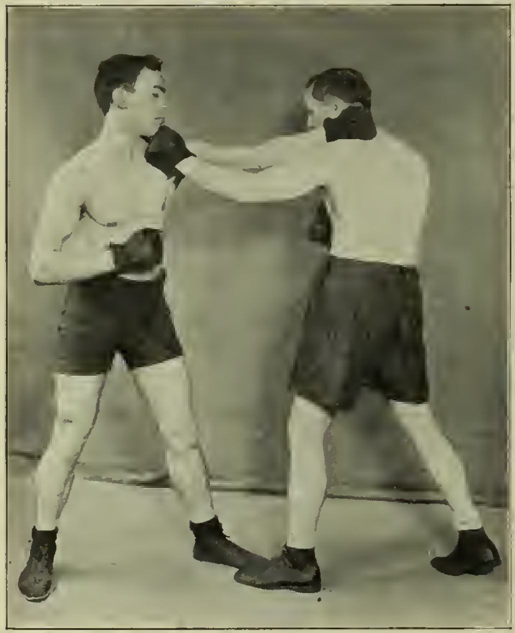
These would come under the designation of "Feints," of which we shall endeavour to give a summary description in due course, but they are only to be learnt by careful practice in sparring with an able instructor.

Double Hit at Body and Head with the Left Hand.—Lead-off at the body in the manner just mentioned above, and, instead of making the rapid retreat there described, bring forward your right foot to its ordinary distance from the left in the guard position and step in again with the left, striking at the face as in leading off with the left, except that here in both in-



Blocking Left-hand Lead to the Body and Countering with Left to the Chin.

stances the palm of the hand should be turned down. In this case, the assault at the body is what is called a "draw," and acts as a feint by drawing off your opponent's attention from his head, which is your real objective.


Stopping Left-hand Lead and Countering with Left Hook.

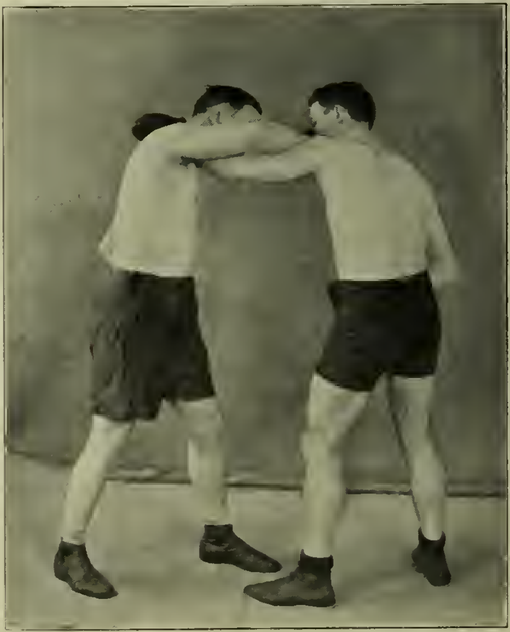
Guard for Double Lead-off.—Form a body guard with the left arm by placing the fore-arm across the body in such a manner as to cover the mark, elbow close to the side, and form your head guard with the right hand in the usual manner.

This double guard is exceedingly useful, and one may often use it when hard pressed or puzzled by a sudden and unexpected rush of an antagonist. It is well in this case to combine it with a movement of retreat.

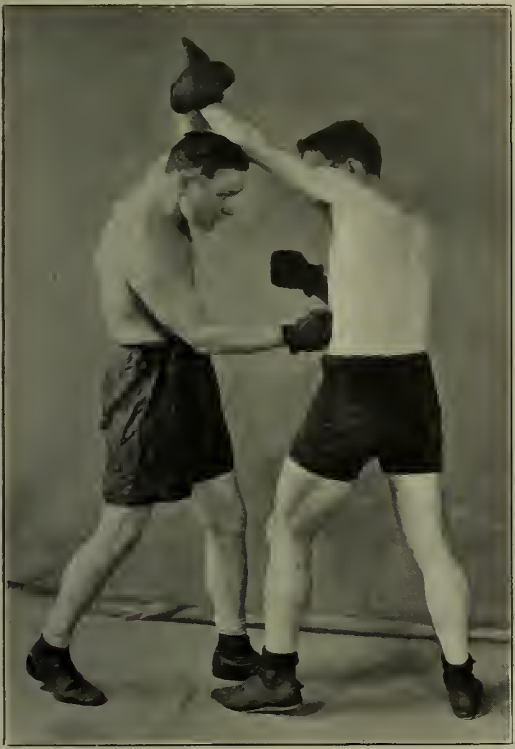
Right-Hand Cross-Counter.—We have now to deal with a movement which, while it forms a most tremendous weapon in the hand of the boxer who knows how to time and execute it with perfect precision and absolute appropriateness in point of time, will land him in great difficulties if attempted at the wrong moment and without sufficient powers of execution. For this reason it is not to be attempted by the tiro until he has achieved a proper degree of proficiency in the various other attacks, stops, and counters. It may be thus described:—Upon your opponent's moving to lead off with his left hand at your head, step in with your left foot inside his, so that the ball of your foot comes into line with that of his, and at the same time duck to your left, so that his hand may pass over your right shoulder, and strike with your right hand, knuckles turned up, at the point of the jaw, bringing your right shoulder well forward, by that means and the forward movement of your body in the duck, throwing the whole of your weight into the blow. The right foot is naturally drawn forward towards the left as this blow is delivered.

The position at the finish, if the movement has been well timed, is that your opponent's blow has passed harmlessly over your right shoulder, whilst your right hand has crossed over his left arm to land upon the point of the jaw. This blow, the force of which is increased by the momentum of the forward movement of both men, very often puts a final stop to an assault by "knocking out" its recipient. Even with muffled hands it comes with tremendous force, and should be rather indicated than actually driven home in friendly sparring.

When the learner has sufficiently educated hand, eye, foot, and, last but not least, judgment, to be able to bring this counter-hit to a satisfactory conclusion he may flatter himself that he has nearly passed out of his novitiate.


Ducking Left-hand Lead and putting Right-hand Cross-counter to the Jaw.

Stop for Right-Hand Cross-Counter.—If you can catch your adversary on the beginning of his movement, before he has had time to duck, hit straight at his head with your left hand, and his movement will be effectually stopped. It is upon slow and tame attempts at leading off that the counters can be safely used, and a determined and straight delivery renders them too difficult and dangerous to be properly executed.



Stopping Left-hand Lead and Countering with Right Hand to Body.

Feints.—The feint is, as its name implies, a feigned attack or simulacrum of attack made to enable you to judge of the plan of defence likely to be adopted by your adversary. It is also made at a certain point preliminary to the real attack, with a view to induce him to cover that point, and in so doing necessarily to uncover some other part at which the real attack will be delivered.

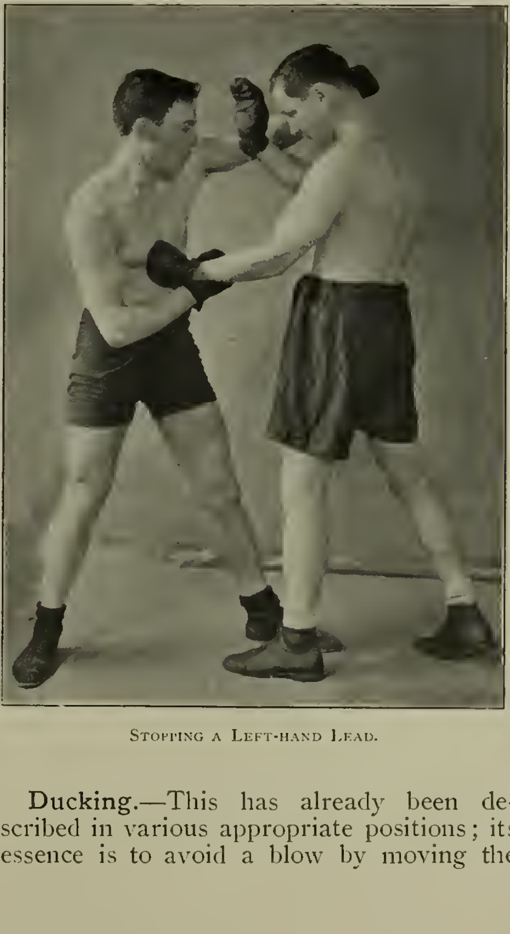
For instance, you may feint a left-hand lead-off at the head by making a quick partial extension of the arm at the same time that you make a short step forward with the left foot. Should your opponent move to a head guard, you can then deliver a left-hand body blow.

Should he cover the head for a moment and immediately return to his ordinary guard you can follow up your feint at the head by a real attack made at the same spot.

Should he show a tendency to counter at the body or cross-counter at the head, you may find an opening for an upper-cut.

If your opponent, priding himself upon the possession of a good right hand, makes repeated attempts to cross-counter, you can make a feint at the head with the left hand to draw his counter, and follow it up with a determined lead-off at the head with a duck to the right, which will entirely spoil his game. Feints are also made with the right hand, but the beginner is warned to be sparing of either feints or lead-offs with this hand. Should it be desired to employ them, feints with the right are made by suddenly drawing back the arm as though preparing to hit, the hand not being "placed" for attack like the left (and this alone would serve to show the danger of leads with this hand). At the same time that you draw the arm back, the left foot is to make a short advance.

Draws.—A draw is but a kind of feint, having for its object to draw your adversary's attack with the intention of countering upon his movement. It is not unlike what is sometimes termed a "combined attack" in fencing.



Stopping a Left-hand Lead.

Ducking.—This has already been described in various appropriate positions; its essence is to avoid a blow by moving the head to one or other side at the same time that it is carried upon a lower plane than that of the general guard.

Slipping.—This affords a way of getting out of an awkward position, such as, for instance, occurs when you have been forced into the corner of a ring, or may be useful in the case of your being subjected to the rush of a man carrying heavier metal than yourself. Upon your opponent's advance, feint a lead-off with your left, duck to the right, and, instead of recovering backwards in the ordinary way, bring up your right foot and make another step forward with the left foot, passing under his left arm. This will bring you on the left side of your opponent instead of his front, and to face him again you must, of course, turn smartly to your left once more.

In-Fighting.—We have so far dealt with what is termed "out-fighting," and have now to describe what happens when two men come to really close quarters: here we have done with all finessing and manœuvring, and the only thing possible is to try to hit quicker and harder than your opponent, and to endeavour to get your hands inside his, as by that means you gain a considerable advantage.

In-fighting is brought about generally by one of the men getting cornered and setting to work to fight his way out like one "rightly struggling to be free," or simply obeying the natural law which dictates combat to every hunted animal whose retreat is cut off, and is often forced by a boxer who finds himself over-matched at out-fighting by an adversary gifted with a better left hand than his own.

When this happens, you will bring your right foot nearly in line (front line) with your left, the ball of the right foot on a level with the heel of the left, and with an interval of about 12 inches separating the two; you will keep your head down by well sinking the chin, while you keep your eyes fixed on your opponent's and strike with right and left hands as quickly as may be at the head, not drawing back the arms too far, and throwing the weight of the body into each hit by bringing the shoulder forward as you strike. Both knees are slightly bent. In beginning in-fighting, the left hand should be aimed at the face, the right hand at the point of the jaw. This gives the desired position inside your opponent's arm. Holding your adversary is not allowed in competitions, and it is better, irrespective of this, to have both hands free and busy in hitting. Blows should mostly be aimed at the head, the mark being visited when occasion offers; they are delivered with a bent arm, and constitute what is termed "half-arm-hitting."

After the delivery of four or five effective blows you must get away smartly. Nothing is more distressing to the onlooker than to see two men, exhausted and out of breath, tumbling up against each other and feebly pushing their gloves each into the other's face.

The above description, although it makes no claim to be exhaustive, will give, we hope, to the inquirer a sufficient idea of the various modes of attack and defence which are most sanctioned by experience.

Other methods of attack there are, no doubt, and some of them, such as the lead-off at head or body with the right hand, have been deliberately omitted, as we consider that they lay the boxer dangerously open when opposed to a man with a good left hand; and it is well, in accordance with the ancient precept "never despise your antagonist," always to behave as if you had a good man in front of you.

It used to be the custom in works on boxing to describe various wrestling movements such as the "cross-buttock," "back-heeling," &c., &c., and also what is named, by a kind of innuendo against the legal system of this country, "getting into chancery," from which it was as difficult to extricate a pugilist as a litigant; but since the well-nigh complete extinction of the old system of prize-fighting, these, with all sorts of holding and gripping, have been excluded from the field of legitimate boxing and particularly tabooed by the Amateur Boxing Association.

Training.—It may be expected that we should say a few words as to the mode of preparation for boxing, although we cannot lay down a complete system of training for boxing competitions.

The boxer who wishes to maintain himself in good and tolerably hard condition and to develop quickness and activity, is, in the first place, recommended to avoid such exercises as tend to produce a huge and unwieldy development of muscle, which, however imposing in appearance, would only make him ponderous and slow in his movements. The rapid motions of the torpedo-boat are rather to be imitated than the slow, if majestic, progress of a first-class ironclad, and while the weight of the body should be employed in driving home the force of a hit, inert weight is of but little use. Weight-lifting, practice with heavy dumb- or bar-bells, Indian clubs, and slow gymnastic exercises, are therefore to be carefully avoided.

Quick movements with dumb-bells weighing from two to three pounds each, stepping in and striking at a suspended football and getting away smartly from its recoil, or, following the example of many distinguished boxers, skipping with a skipping-rope, with plenty of walking exercise, and occasional sprinting, or running a distance of about sixty yards at top speed, are exercises admirably adapted to develop the breathing power and to induce quickness and alertness on the feet. Fencing and sabre or stick-play might be looked upon as excellent practice for sparring, were it not that they themselves demand so large a share of the attention of their devotees. Lawn tennis, no doubt, requiring, as it does, quick movements and a watchful and attentive eye, is an admirable preparation for boxing. In fact, any exercise which tends to increase the respiratory powers and to develop the muscular system by a series of active movements not entailing too great an expenditure of force at a given moment may safely be recommended.

Above all, let the learner never throw away any chance that may present itself of engaging in friendly sparring with the best men he can induce to put on the gloves with him; and let him rest assured that he will always find the best performers the best tempered and the most opposed to slogging and roughing.

B. JNO. ANGLE.
G. W. BARROLL.

GLOSSARY.

Break away.—To get away from an opponent.

Break ground.—To take up a fresh position to the right or left.

Bye.—In a competition where the number is uneven, the odd man is said to draw a "bye," and has to box the usual number of rounds with a non-competitor.

Corner.—The opposite angles of the ring in which contestants sit during the intervals between the rounds.

Catchweight (To box at).—Boxing without restrictions as to weight.

Counter.—A blow given in response to an opponent's lead-off, as nearly as possible simultaneously.

Cross Counter (Right Hand).—A blow at the head delivered with the right hand, across an opponent's left lead at the head.

Draw.—A feigned attack, to cause an adversary to expose his tactics.

Duck.—Inclining the head to left or right to avoid a blow.

Feint.—A show of attack made at one spot, in order to make an adversary guard that, and in the act uncover some other point.

Foul.—An act committed contrary to the rules of boxing.

Gloves.—Leather gloves padded with horsehair used in boxing.

Guard.—Defence with either arm to protect the head or body.

In-Fighting.—Fighting at close quarters.

Judges.—Two officials placed at opposite sides of the ring. If their opinions agree the winner is declared, but should they disagree, the judgment of the Referee is demanded.

Knock-out.—A blow which, in the opinion of the Referee, decides a bout by the temporary disablement of a contestant.

Lead-off (Left hand).—A hit with the left hand (not a counter) at the head or body.

Mark.—The pit of the stomach.

Out-Fighting.—Leading off from a distance and preventing your adversary from getting to close quarters.

Point.—Either side of the chin.

Referee.—The official whose judgment is appealed to in the event of the judges disagreeing. He is invested with supreme power, and his decision is without appeal. He can disqualify a competitor in the event of a foul, or stop a contest when he decides that sufficient punishment has been administered.

Ring.—A roped enclosure, of not less than 14 ft. square in open competitions.

Round.—A period of time, usually of three minutes' duration, during which the boxers are continuously engaged. In competitions governed by the rules of the Amateur Boxing Association, three rounds are contested, two of three minutes and one of four, with an interval of one minute between each round.

Seconds.—Men, generally professional boxers, appointed to attend on the contestants in the intervals between the rounds. During the progress of the rounds they must be outside the ring.

Side Step.—Consists in drawing the left foot slightly behind the right foot, and springing sharply off the ball of the left foot towards the right front.

Slipping.—On the adversary leading off, a long step forward, combined with a duck, is taken with the left foot, thereby avoiding the line of attack.

Stop.—Frustrating the adversary's intention by a more rapid attack.

Time.—The call to commence or conclude boxing.

Timekeeper.—The holder of the watch, who times the duration of the rounds and of the intervals between the rounds.

Upper Cut.—This blow is in reality a counter, delivered upwards with either hand, when an opponent leads off or rushes in with his head down.

Weights.—Boxers are divided by the Amateur Boxing Association into five classes, according to their weights, as follows:—

Bantam Weight, not exceeding 8 st. 4 lb.
Feather Weight, not exceeding 9 st.
Light Weight, not exceeding 10 st.
Middle Weight, not exceeding 11 st. 4 lb.
Heavy Weight, any weight.

Bibliography.—*Boxiana*, Pierce Egan (G. Smeeton), 1818—1824; *Self-Defence*, E. Donnelly (Weldon), 1879; *Pugilistica*, H. D. Miles (Weldon), 1880—81; *Boxing*, E. B. Mitchell, Badminton Library (Longmans), 1893; *Physical Culture and Self-Defence*, R. Fitzsimmons (Gale and Polden), 1902; *Fights for the Championship*, F. W. J. Hemming (L.V. Gazette Office), 1902; *Kings of the Queensberry Realm*, W. W. Naughton (The Continental Publishing Co., Chicago), 1902; *Self-Defence*, R. G. Allanson-Wynn and C. E. Walker (Lawrence and Bullen), 1903; *Manuel de Boxe et de Canne*, E. André (Garnier), 1904; *Pugilato e lotta per la defesa personale*, A. Conquet (U. Hoepli, Milano), 1898; *Boxing at a Glance*, J. M. Wright (Upcott Gill), 1909.

BREAM (*Abramis brama*). [*See* ANGLING (COARSE FISH).]

Length of head 5 to 6, of caudal fin 4⅓ to 4⅔, height of body 3 to 3⅔ in the total length. *Eyes*—diameter 4½ to 5½ in the length of the head, 1½ diameters from the end of the snout, and 2 diameters apart. Body oval, elevated, and strongly compressed. Head small, snout short and obtuse, mouth protractile and small, upper jaw slightly the longer and reaching posteriorly to below the anterior nostril, lips moderately developed. *Teeth*—pharyngeal; 5/5 compressed and notched at their extremity. *Fins*—the dorsal commences slightly behind the base of the ventral, and about midway between the front edge of the eye and the base of the caudal fin, and just below the end of the highest point of the dorsal profile, while its last ray is on a line with the first of the anal; it is highest anteriorly. Pectoral inserted low down, and as long as the head excluding the snout, it reaches to above the commencement of the ventral, and the latter to the origin of the anal. The anal fin is falciform, and highest anteriorly. Caudal deeply forced. *Scales*—of medium size, higher than wide, 6½ or 7½ between the lateral line and base of ventral fin. On the edge of the abdomen between the ventral and anal fins, the scales do not pass across, forming a sharp keeled edge. *Lateral-line*—curves downwards, passing along the lower third of the body to the base of the caudal fin. *Colours*—back of a dull olive or sea-green, lighter on the sides and beneath, the abdomen being silvery tinged with pink. In old fish the body becomes more of a yellowish colour. Fins brownish, the pectoral rays being often tinged with scarlet, which colour may be seen in the first few rays of all the other fins. Day, *Fishes of Great Britain and Ireland*, vol. ii., p. 193.

BREAM-FLAT OR WHITE BREAM (*Abramis blicca*). [*See* ANGLING (COARSE FISH).]

Length of head 5½ to 5¾, of caudal fin 5, height of body 3¼ to 3½ in the total length. *Eyes*—diameter 3¼ to 4¼ in the length of the head, 1½ diameters from the end of the snout, and 2½ diameters apart. Body oblong, elevated, and compressed; dorsal profile in an almost regular curve to the commencement of the dorsal fin, from whence to the caudal it is somewhat concave; head rather small; snout short and obtuse; upper jaw slightly the longer, extending backwards almost to beneath the front edge of the orbit; mouth protractile, lips rather thick. *Teeth*—pharyngeal in two rows, 5-4, 2-3/3-2, 4-5. *Fins*—dorsal commences behind the insertion of the ventral and about midway between the front edge of the eye and the base of the caudal fin, and just beyond the termination of the highest point of the dorsal profile, while it extends usually to above the third or fourth anal ray, but occasionally not quite so far. Pectoral inserted low down, and as long as the head from behind the nostrils; it reaches to above the commencement of the ventral, which latter does not extend to so far as the anal. Anal falciform, highest anteriorly. Caudal forked. *Scales*—of medium size, higher than wide, five to six rows between the lateral line and the base of the ventral fin. On the abdominal edge, between the ventral and anal fins, the scales do not pass across, forming a keel. *Lateral line*—passes downwards and is continued to the base of the caudal fin. *Colours*—silvery, darkest along the back, sides tinged with rose-red, fins of a bluish colour, the dorsal, anal, and caudal, with dark outer margins, the pectorals and ventrals tinged with red. Day, *Fishes of Great Britain and Ireland*, vol. ii., p. 197.

[*Photo. by W. S. Berridge, F.Z.S.*

BREAM-FLAT.

BREAM, SEA (*Pagellus centrodontus*). [*See* SEA FISHING.]

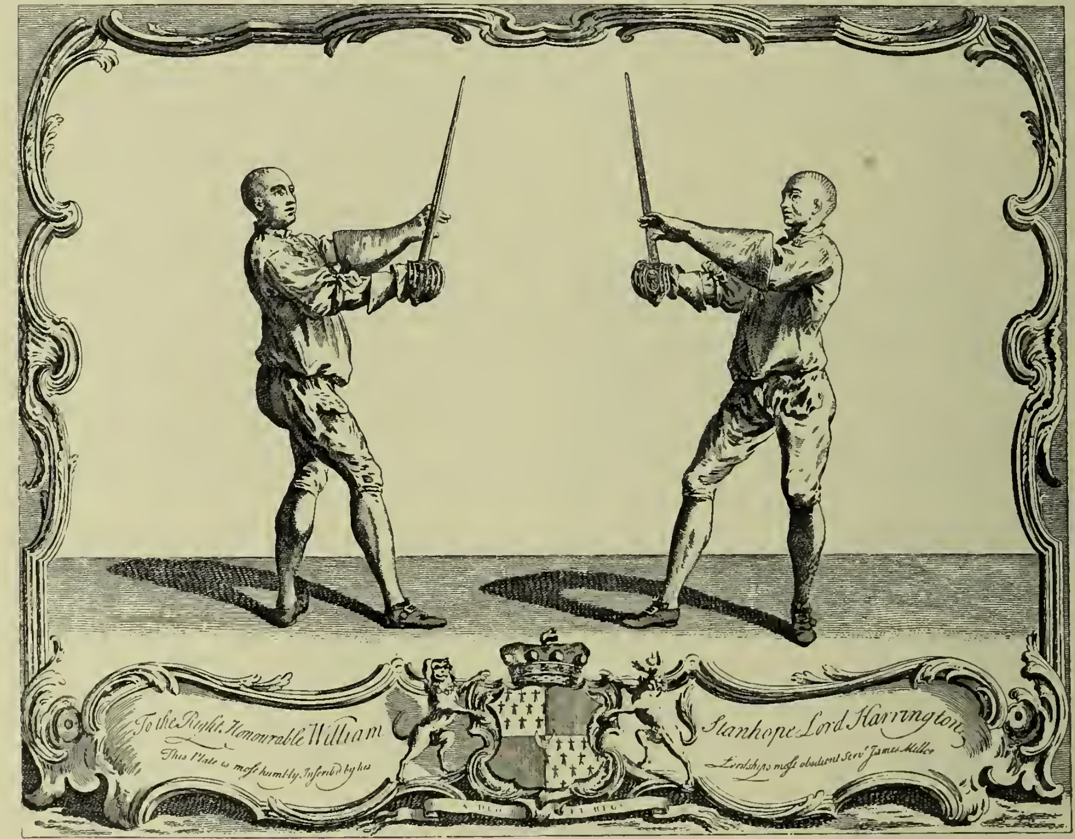
Length of head 3¾ to 4, of caudal fin 5 to 5½, height of body 3¼ to 3½ in the total length. *Eyes*—3¼ to 3½ diameters in the length of the head, 1 diameter from the end of the snout, and also apart. Interorbital space flattened. Preorbital wider anteriorly than it is posteriorly, its greatest depth being scarcely equal to half its length: it is unnotched over the posterior end of the maxilla. Opercle about twice as high as wide. Jaws of equal length in front; the maxilla reaches to beneath the front edge or even anterior third of the eye. Posterior nostril the largest and obliquely oval. *Teeth*—three or four irregularly placed rows of rounded teeth of different sizes laterally and posteriorly in either jaw, none on vomer, palatine, bones, or tongue. *Fins*—dorsal spines rather strong, the fourth and fifth the longest, from whence they decrease in length; rays shorter than the spines, the last two somewhat thickened but not scale nor adherent together; Donovan observes that in his example there were thirteen spines and eleven soft rays in the dorsal fin, the same number being shown by the artist. Pectoral as long as the head. Ventral not extending so far as the vent. Third anal spine somewhat longer than the second. Caudal deeply forked. *Scales*—finely ctenoid, seven rows between the eye and the angle of the preopercle. *Colours*—orange-scarlet, becoming lighter beneath. A large black spot on the shoulder intersected by the lateral line, but is absent in the young. Couch believed that it does not appear till they are twelve months old. Day, *Fishes of Great Britain and Ireland*, vol. i., p. 36.

[*Photo. by W. S. Berridge, F.Z.S.*

SEA BREAM.

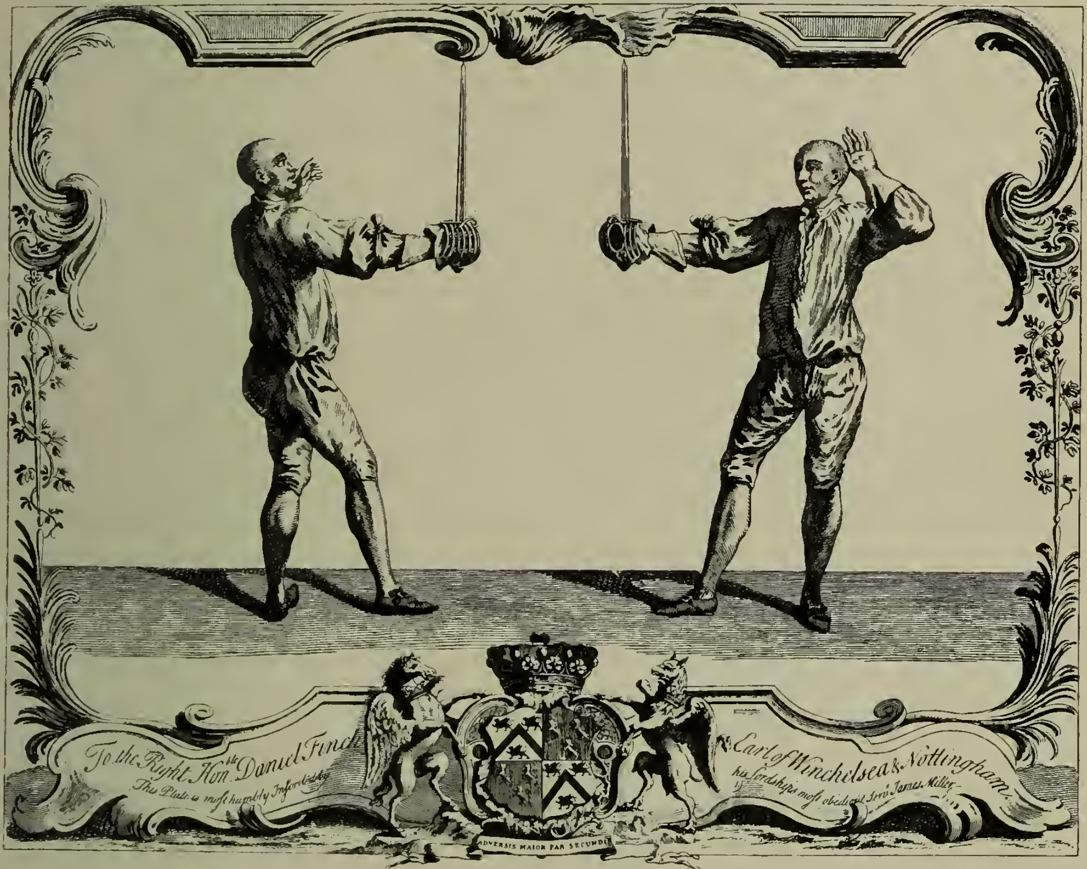
BROADSWORD.—This weapon—designed for both cutting and thrusting, but pre-eminently for the former, as the rapier for the latter—has been the typical arm of the Englishman for four centuries, during which it has varied considerably in form. In its early days it had only a plain cross hilt, sometimes accompanied by an outer ring, and a double-edged blade; it was then used for attack only, and the defence was made with its faithful companion, the hand buckler. Later on, this little shield, being irksome to carry on the person, went out of use, and the sword had to be employed both for offence and protection. The masters of the Elizabethan period had to teach the use of "verie manye weapons," mostly accompanied by an arm of defence carried in the left hand; but among their lessons they all laid considerable stress on the management of the "short syngle sword," which in course of time came of necessity to be provided with a "close" or basket hilt. In the last three centuries we find but very few works on the subject. The men who practised the art professionally were rough fighting fellows, skilful in the use of their weapons, and some of them possessed of the rare faculty of imparting their knowledge to others; but they were mostly unlettered men and unable to record it in book form. What we know of the earlier stages of the art we owe mainly to enthusiastic amateurs.

We must consider first the man who should be regarded as the father of English broadsword play, George Silver, who published in 1599 a little book named *Paradoxes of Defence*, which contains interesting matter but no instructive details. He afterwards wrote—and wrote only, for the works exist but in MS. form—two other books, *Brief Instructions on my Paradoxes of Defence*, and *Rules of Defence to be observed in open Fyght, &c.*, which are full of clear and concise information. In Silver's time the *lunge*, as we understand it, was unknown. Two hostile men "drew on sight," they approached each other by "passes" or steps, each manœuvring to place his enemy in a disadvantageous position when he would make a sudden rush upon him. Silver advises three principal "fyghts"—we call them "guards"—although he had many others: the "*Gardant fyght is to carry your hand and hylt above your hed w^{t} your poynt downe towards your left knee, w^{t} your sword blade somewhat neer your bodye, not bearing out your poynt but rather declynynge it a little towards your said knee, y^{t} your enemye crosse not your poynt and so hurt you.*" The second is the "*Bastard gardant fyght, w^{ch} is to carry your hand and hylt below your hed brest hye or lower w^{t} your poynt downwards towards your left foot.*" The third is "*forehead, y^{t} is w^{t} poynts high, and hands and hylts lowe*"; in this guard the point was held quite upright. The "wards" or parries were made from these middle positions by moving the sword to the right or left, and they had no other distinctive names. Silver is the first author of any nationality who distinctly advocates parrying and riposting, to which he devotes an entire chapter "*of div^{rs} advantages y^{t} you may take by stryking from your wards at y^{e} sword fyght*"; and he also gives a chapter on "*The manner of certaine gryps and clozes to be used at the syngle short sword fyght.*" These grips were methods of overpowering the enemy by seizing his sword hand when he ran in close enough to make it possible. After Silver's day the lunge made its appearance, and the rough methods of running about and "charging" became tempered into the more refined school of later times. In the seventeenth century we find very little to help us. There appeared in 1639 a little book *Pallas Armata,* which treats of the sword, but is far less complete than Silver's *Brief Instructions,* and towards the latter end of the century we have the numerous works of Sir W. Hope, of Balcomie, another famous amateur, who gives us, unfortunately, but very little of the broadsword. In the eighteenth century, however, we get more light in the beautiful album of engravings by Captain James Miller (1737) which relate to the work of the "gladiating" prize-fighters, who fought their battles with weapons sharp enough to cut the calf of a man's leg so badly that "it hung over his heel like a flap." We now find Silver's "gardant fyght" still surviving under the name of the "hanging guard," but with the point much more advanced than formerly. The gladiators held this guard in high contempt, dubbing it the coward's guard, being a good one for a timid man to shelter under, but a bad one for a bold man to attack from. Then we have Silver's "forehand," exactly reproduced under the name of the "medium," with varieties in the form of the inside and outside guards, in which the points were still kept very high, though not "bolt upright." Concerning the practices of the gladiators, we learn a great deal from another enthusiastic amateur, Captain John Godfrey (1747), a practical man who says, "I have purchased my knowledge in the backsword with many a broken head and bruise in every part of me"—in his day there were no such luxuries as fencing-masks. In 1771 there was published a valuable though unillustrated work by A. Lonnergan, by a professional this time, and certainly the most accomplished master of the gladiator period, for whose precepts Miller's beautiful plates still serve as illustrations. He embodies all Miller's ideas in a series of very practical lessons, and he also holds to some of the rough work of


To the Right Honourable William
This Plate is most humbly Inscribed by his
Stanhope Lord Harrington
Lordships most obedient Serv^t James Miller

Sword and Gauntlet.

Silver's day, notably the blow in the face with the pummel. We now reach the closing years of the eighteenth century, when we have in 1798 the Angelo-Rowlandson *Hungarian and Highland Broadsword Exercise*, and Roworth's *Art of Defence on Foot with the Broadsword and Sabre*, neither of which differs materially in its methods from Miller and Lonnergan, and both of which contain the useful *Ten Lessons of Mr. John Taylor*, a sturdy swordsman of the good old school, whose name is recorded only in these two books.


To the Right Hon.ble Daniel Finch
Earl of Winchelsea & Nottingham.
This Plate is most humbly Inscribed by
his Lordships most obedient Serv.t James Miller.
ADVERSIS MAIOR PAR SECUNDIS

Medium Guard. (Miller.)

In 1804 a new edition of Roworth came out in which the "medium" guard disappeared, and in the "inside" and "outside" guards the point is lowered into the positions of quarte and tierce as now understood.

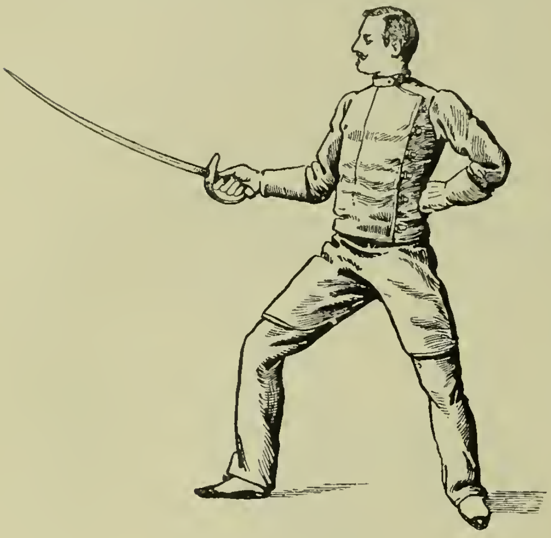
In 1817 the first edition of Angelo's "authority," and after this point we notice the decadence of English swordsmanship, when the teaching of it was taken out of the hands of the highly trained fencing master, and transferred to those of the mere drill sergeant.

In 1880, however, Professor J. M. Waite, a retired non-commissioned officer of the 2nd Life Guards, was of necessity much resident in London, and able to profit by gaining instruction from two famous masters, M. Pierre Prevost and Mr. Platts. He produced a highly practical manual, *Lessons in Sabre and Singlestick*, &c., in which he dismissed the old hanging guard, and retained the inside and outside, but used in preference to all three the "High Seconde," which was at that time the guard most in fashion; it was good to shelter under, but very fatiguing to the arm if maintained for any length of time. It is worthy of note that the fencing sabres used in Waite's day were very heavy, quite equal to the Infantry officer's sword, and his book was written with the view of training the swordsman for war purposes.

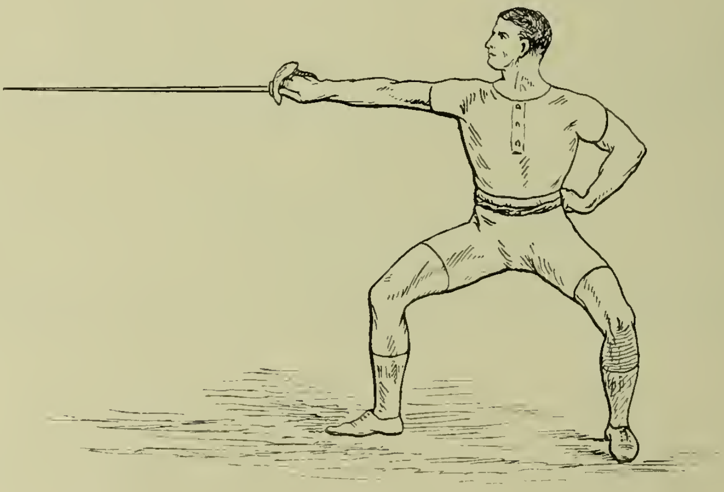
In 1889 I myself endeavoured to transmit in my *Cold Steel* the old English play with certain additions from modern Italian masters, especially Parise and Cesarano; but the engaging guard which I find most useful for general purposes is a "medium"

I adapted from the "Guardia mista" of Alfieri (1640), in which the upper arm and especially the deltoid muscle is in very reasonable repose, and I added to this a "Resting Medium" with the sword hand lowered a few inches until the pummel rests on the thigh, which thus supports the whole weight of both arm and sword, and the man's physical resources are held in reserve until they are required for action.

ALFRED HUTTON.



MEDIUM GUARD. (HUTTON.)



MILITARY GUARD.

GLOSSARY.

Advance.—The advance is made when the opponent is beyond the reach of a lunge, and is effected by stepping forward with the right foot about 6 in., and then bringing up the left the same distance.

Arrest.—The arrest is a direct point delivered during the development of some action of attack.

Attack.—The attack (or **appel**) is the preliminary tap of the right foot before attacking. It may be single or double. The latter is a beat with the heel and then the flat of the foot in rapid succession.

Backsword.—Old term for Broadsword (*q.v.*).

Beat.—A movement which strikes the opponent's blade, in order to force it aside, and thereby to acquire an opening.

Broadsword.—A sword which is sharpened upon one edge and blunt upon the other, with the exception of a space extending some 8 in. from the point towards the hilt. This is also sharpened, and is termed the **False edge.** Also known as **Sabre,** and formerly as **Backsword.**

Carry Swords.—The order to hang the arm at full length, holding the sword upright, so that the edge faces the opponent, and the back rests upon the hollow of the right shoulder.

Centre of percussion.—"Is that part of the blade which should strike the object at which the cut is directed. It is situated at about three-quarters of the length of the blade from the hilt. A cut given with any part of the blade above or below this point loses its effect from defective leverage."—(*Fixed Bayonets,* Hutton.)

Commanding is the seizure of an opponent's weapon or person. Now obsolete.

Corps à Corps.—The term used to describe the position when the combatants have come so close that they can grapple with each other.

Counter.—A hit delivered at the same moment as an opponent's. Similar to a counter in Boxing. Also used as verb.

Counter-time.—A blow delivered at an opponent's arm, when he attempts a **timehit** (*q.v.*)

Cut.—A stroke delivered with the edge of the sword. There are seven primary forms:—

(1) A diagonal downward stroke at the left side of the opponent's head.

(2) A diagonal downward stroke at the right side of his head.

(2) A diagonal upward cut at the inside of his right knee.

(4) A diagonal upward stroke at the outside of his right knee.

(5) A horizontal stroke at his left side.

(6) A horizontal stroke at his right side.

(7) A vertical downward stroke at his left side. An eighth is sometimes added by Italian swordsmen :—

(8) A vertical upward stroke at the fork.

Cutlass.—A short broadsword chiefly used by sailors and marines.

Disengage.—To quit that side of the opponent's blade on which one is opposed by his guard, in order to effect an attack where there may be an opportunity.

Distance.—[*See* MEASURE.]

Draw.—A deliberate exposure of some point in order to attract the opponent into delivering a stroke, for whose defence and reply one is fully prepared. Also called **Invite.**

Draw swords.—The order to draw the swords from the scabbards and range them perpendicularly with the full stretch of the arm, the edge being to the rear.

Drawing cut.—A stroke in which the edge, instead of falling motionless, moves along the surface which it meets, thereby increasing its cutting power.

Engage.—To touch the opponent's sword as a preliminary to a contest, in order to ensure the readiness of both.

Engaging guard.—[*See* GUARD.]

False edge.—[*See* BROADSWORD.]

Feeble or **Foible.**—The half of the blade from the point, which is the weaker.

Fort or **Forte.**—The half of the blade from the hilt, which is the stronger.

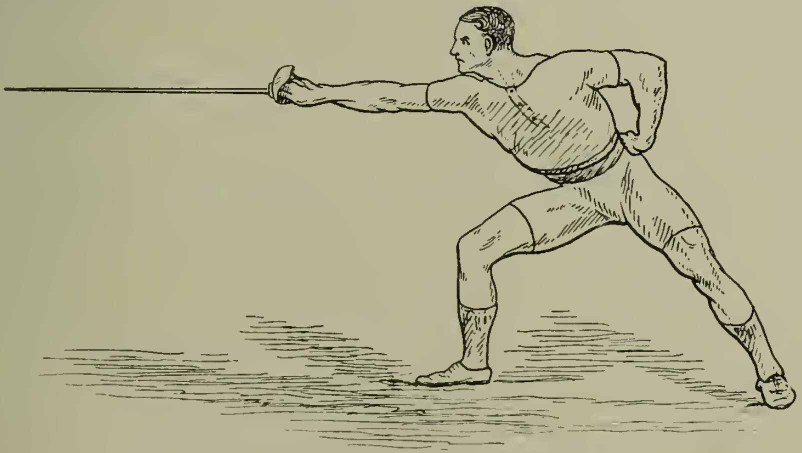
Gain.—A swordsman is said to make a "gain" when after a lunge he recovers his position, not by withdrawing his right leg, but by bringing up his left.

Grip.—That part of the sword which the hand grasps.

Guard.—The position of body and sword which is safest for defence and most ready for attack. There are four chief guards to one or other of which the swordsman should constantly return after an interchange of blows, and these are known as **Engaging Guards.**

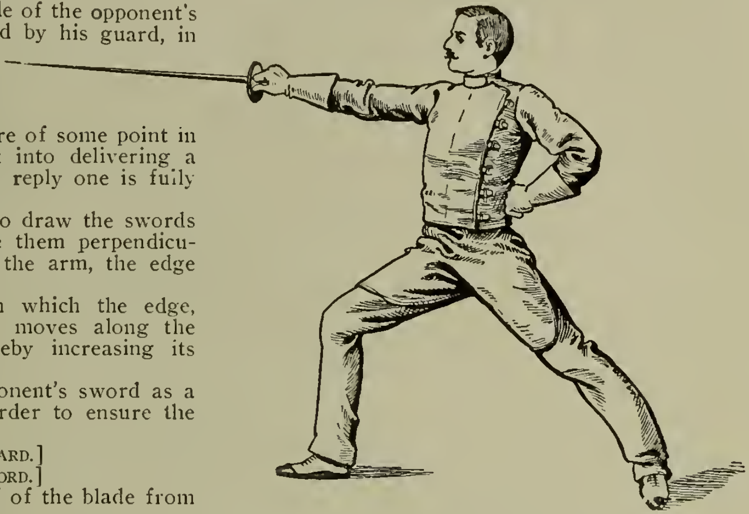
(1) The **Medium Guard**, in which the elbow is about 6 in. from the right hip, the edge inclined downward, and the point towards the opponent's face.

(2) The **Hanging Guard**, where the arm is raised above the head, the edge of the sword upward, and the point directed downward and toward the left. A variety of this is the Low **Hanging Guard**, in which the arm is held lower, but the sword points in a similar direction.



THE LUNGE. ("INFANTRY SWORD EXERCISE.")

(3) The **Inside Guard** is formed by keeping the wrist about the level of the waist, and the point about the level of the eyes, with the edge turned inward.



THE LUNGE. ("THE SWORDSMAN," 1891.)

(4) The **Outside Guard** is similar to the above, except that the edge is turned outward. The special defensive movements against the various cuts are sometimes called "guards," but are more properly Parries (*q.v.*).

Hilt.—The part by which the sword is grasped, and which affords protection to the hand.

Invite.—[*See* DRAW.]

Loose Play.—A contest in which the combatants deliver strokes and effect parries, not in any regular sequence, but as they think each may be most effective.

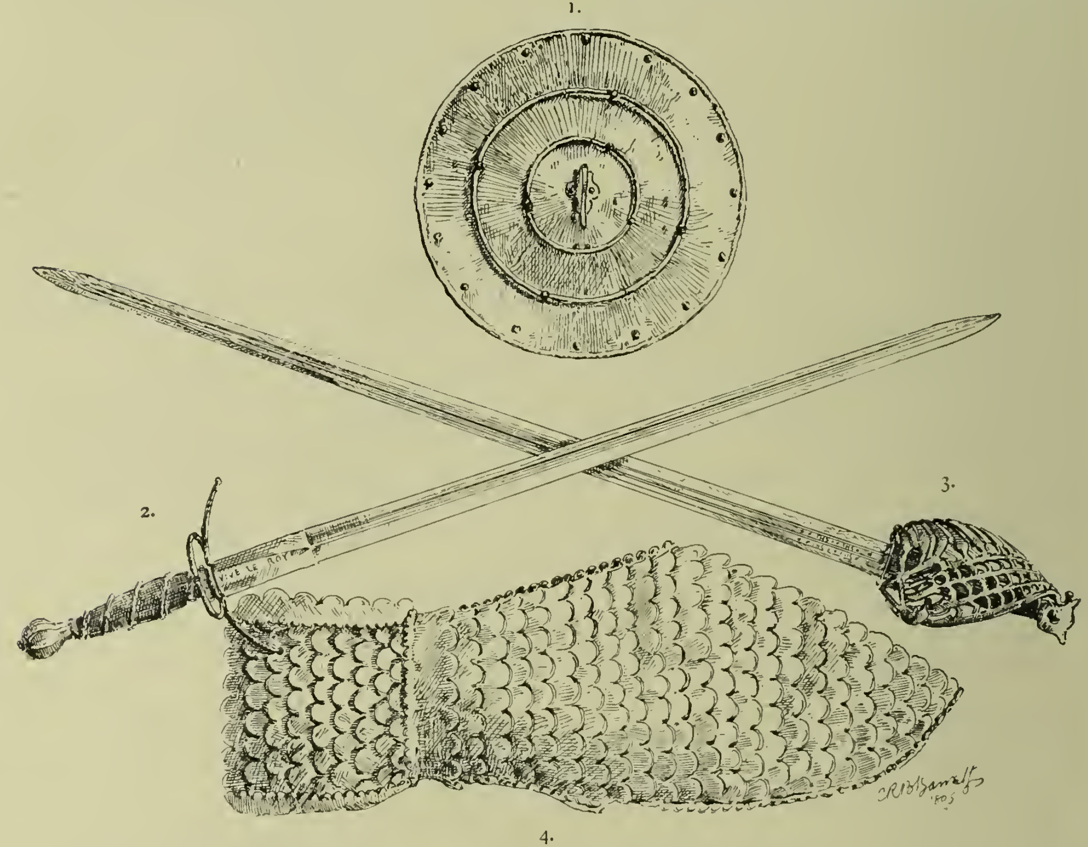
Lunge.—The completion of the attack, which is effected by stepping forward with the right foot two soles' length beyond the position of guard.

Mask.—A helmet of wire netting protecting the face from injury, but giving full sight of an opponent.

Measure.—The exact space in a direct line between the combatants, which must be traversed by a lunge. Hence **Perfect Measure** is when an opponent can be fairly struck without previously moving the left foot. **Out of Measure,** when one must advance at least a step to touch an opponent. **Within Measure,** when one can touch an opponent without lunging. (Also called **Distance.**)

Moulinet.—A rehearsal of various cuts in one continuous swing of the sword.

Opposition.—The covering one's self with the **Shell** (*q.v.*) of the sword when making an attack, so as to ward off a counter hit from an opponent.



1. Hand Buckler, time of Henry VIII., with Sword-breaking Rings and Belt-hook.
2. Double-edged Broadsword, Time of Henry VIII.
3. Basket-hilted "Schiavona," 17th Century.
4. Great Parrying Gauntlet of Buff Leather, worn on the Left Arm. (*See* p. 350.)

Parade.—[*See* Parry.]

Parry.—A defensive movement against some particular stroke of an opponent's; sometimes confined to a defence against the point.

The parries in reply to the Cuts (*q.v.*) are—

Against	Cut	1.	Parry	quarte.
,,	,,	2.	,,	tierce.
,,	,,	3.	,,	septime or low prime.
,,	,,	4.	,,	seconde.
,,	,,	5.	,,	low quarte or prime.
,,	,,	6.	,,	low tierce or seconde high.
,,	,,	7.	,,	high quarte or high tierce, or the St. George.
,,	,,	8.	,,	horizontal quarte.

Pass.—The pass is the stepping forward with the rear foot and bringing it one pace in advance of the other. Now obsolete.

Point.—A thrust delivered with the point of the blade. There are two chief forms.

(1) Delivered with the hand in supination.

(2) Delivered with the hand in pronation.

Pronation.—The position of the hand when the knuckles are uppermost.

Pummel.—The lump of steel at the end of the hilt which balances the weight of the sword.

Recover Swords.—The order to drop the wrist from the "draw swords" position, to the level of the chin, the blade upright, and the edge to the left.

Redouble.—To deliver a second blow very quickly after recovery if the opponent does not at once make a Riposte (*q.v.*) after parrying the first. Not to be confused with **Remise** (*q.v.*).

Remise.—A second stroke made upon the same lunge as the first, when an opponent does not reply at once after parrying.

Reprise.—"This word has three meanings: 1st, in an assault it is a second thrust made on the same lunge, but after having previously found the opponent's blade; 2nd, in a treatise on fencing it is a term applied to a series of set lessons, such as 'les quatre reprises de Jean Louis'; 3rd, in a duel it means a series of attacks, parries and ripostes which occur whether ending in a hit or no."—(*Fixed Bayonets,* Hutton.)

Retire.—To give ground intentionally by withdrawing the left foot 6 in., and bringing the right a similar distance after it.

Return.—A blow delivered immediately after parrying an opponent's blow, also called **Riposte.**

Return swords.—The order to replace the swords in their scabbards.

Riposte.—[*See* Return.]

Sabre.—[*See* Broadsword.]

Saint George.—The special name attached to the seventh parry (*q.v.*) which guards the head.

Shell.—The part of the hilt which protects the hand from injury.

Slip.—To withdraw the part of the body at which an opponent aims in order that, finding no resistance, he may overbalance himself, and give an opening for a cut.

Slope swords.—The order to carry the weight of the sword upon the right shoulder, the elbow close to the body, and the arm bent straight forward at a right angle.

Spadroon.—A light broadsword, now obsolete.

Stop-thrust.—A thrust delivered at an opponent at the moment when he advances for the attack.

Supination.—The position of the hand when the palm is uppermost, or, if the fist be closed, the nails.

Tang.—The narrow piece of soft metal which is attached to the blade of the sword, and fits into the hilt.

Target.—A circular or oval piece of wood or linen about 14 in. in diameter, with the cuts and guards marked upon it, before which the learner can rehearse by himself; also that part of the body and limbs on which hits are allowed to count.

Thrust.—A stroke delivered with the point and not the edge of the sword.

Time cut, hit, or thrust.—The putting in of a cut or thrust at the exact moment when the opponent is shifting his position, especially when he does so in preparation for an attack. To be distinguished from a **Counter,** which is a stroke delivered, not before, but at the moment of, an opponent's attack.

Transport.—"The transport is the passing of an opponent's blade from one position to another, describing a conical movement." (F. V. Wright.)

Traverse.—The traverse is a shifting of the ground circular-wise to either side, and is effected by moving either foot outward a distance of 6 in., and bringing the other opposite to it.

Under Stop-thrust.—A thrust delivered to meet an opponent's advance, the left foot being allowed to glide backward, and the whole weight falling on the right leg.

Volte.—Any sudden leap to avoid a stroke. Especially a turning of the whole body upon toe or heel.

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BUFFALO, AFRICA. — Description and Habits.—The Cape Buffalo (*Bos caffer*) is called in the Zambesi district *Nyati* or *Mboga*, and in Bechuanaland *Nari*. In height it stands 4 ft. 8 in. to 4 ft. 10 in.; its body is massive and covered with black hair; the skin of belly and inside of thighs a blackish red, very sparsely covered with hair. The horns of an average full-grown bull should measure 36 inches in width (outside measurement) across the widest part, 25 inches from tip to tip, and 14 to 15 inches depth of palm at base.

The African Buffalo is generally described as the most savage and vindictive of all ruminants, but it is doubtful whether he fully deserves this character. His aspect is certainly ferocious, but this is caused by the massive weight of his body, the great breadth and thickness of his heavy horns, and especially by the savage expression of his little bloodshot eye. Unless wounded or suddenly disturbed, a Buffalo will seldom charge. As a rule, whether come upon singly or in a herd, they prefer to seek safety in flight; but a cow with a calf will often charge, and keep on charging after the remainder of the herd has fled. Old bulls which have been driven out of the herd and compelled to wander about alone, or in company with two or three other unfortunates, will occasionally charge if suddenly disturbed; and many a hunter has found himself in an unpleasant position on coming suddenly and unexpectedly in front of an old bull standing dozing in high grass. The first impulse of the startled animal is to rush blindly forward, and whatever happens to be in the way has to go, as nothing weaker than a wire rope will stop him. Except from cows when they have calves running by their sides there is no danger in approaching a large herd of buffaloes in the open; and the bigger the herd the less the likelihood of a charge.

In 1894 the writer, accompanied by two native boys, came across a herd of fully 700 buffaloes feeding on the short grass of the Manamtoi plains near Sarmento. Burchell's Zebra, Blue Wildebeeste, and Lichtenstein's Hartebeeste were feeding with the buffalo, each species keeping pretty well together. Not being in want of meat, and having already secured several good heads, the writer walked out of the high grass which fringed the open plain on which the game was standing, and made straight for the dense mass of animals; without any intention of firing a shot, and merely to see how near they would allow him to approach them in the open. The zebra and the wildebeeste were the first to run, the former with many a kick and prance, and the latter frequently halting in their lumbering gallop to wheel round and toss their comical heads; but after both zebra and wildebeeste had disappeared into the high grass and palm scrub, the buffalo remained standing motionless, with noses pushed forward, gazing stolidly at the writer and his two boys as they walked briskly towards the herd. Not until we were within 120 yards of them did they move, and then of a sudden they wheeled round, and the forest of evil-looking heads and horns in front of us was transformed into a mass of black sterns and waving tails rapidly retreating amid a cloud of dust. Not one of these evil-looking brutes thought of charging the three attenuated and fever-stricken bipeds who walked up to them in the open.

But in the case of a *wounded* buffalo it is a totally different affair. It is then that the almost supernatural cunning and devilish ferocity of the animal shows itself. A beast is hit, perhaps, only an inch or two from a vital part (or he *is* hit in a vital part by a bullet from that questionable implement the ·303 rifle), but not dropped, and disappears in the high cover. Beware then how you follow him, for while you and your boys are slowly picking out the blood spoor with eyes fixed on the ground, watching for the red splashes on the grass, the brute will have run back 100 yards or more parallel to his forward tracks, and will be lying in wait ready to spring up and charge out on you as you come opposite him, and the odds are that he is upon you before you have time to raise your rifle. The sense of smell possessed by buffaloes is very acute, and when wounded they will hunt a man through thick cover by this means just as a spaniel will follow the track of a rabbit; but the buffalo, unwieldy looking though he be, is far quicker than the spaniel, and as long as a trace of scent remains he will

Cape Buffalo.

Height at shoulder, 4 ft. 9 in.; av. horn meas. 36 in.; max. horn meas. 49⅓ in.

follow it, eager to avenge, while his strength remains, the death wound he feels he carries in him.

A buffalo does not charge blindly with head down, as do the European members of the bovine family. He carries his head at an angle of only a few degrees off the horizontal, and it is only at the moment of striking that the head is lowered and the horns brought into position for a sidelong thrust—consequently a charging buffalo offers very little chance of being stopped by a bullet, even if there is time to aim; for, though he may be struck on the very small mark offered by the lower part of the forehead where unprotected by the massive horns, the bullet (if of ordinary calibre) is certain to glance off owing to the angle at which the head is carried. The nose is the part to aim at; for even if the brain is not touched by this means, the bullet will penetrate the neck and chest, and so disable the animal as to stop him in his charge. If a wounded buffalo escapes into thick bush or high grass, the wisest plan is to wait an hour before following him. He is certain to lie down before going far, and will become weak and stiff from loss of blood, and therefore less likely to make a sudden charge.

The greatest caution should be exercised when approaching an apparently dead buffalo. So long as the slightest movement of the sides (caused by respiration) is visible, he is capable of staggering to his feet and annihilating his pursuer. The writer once had a narrow escape in this way. Being in want of meat for the camp, he went out in the early morning to secure it, and from the top of an anthill sighted five buffaloes on a small patch of short grass slowly feeding towards some heavy thorn and palm scrub in which they probably intended to lie up during the heat of the day. It was easy to run through the long grass up to within forty yards of them, and a bullet from the first barrel dropped a cow stone dead, while that from the second barrel appeared to have the same effect upon a scarcely full-grown bull, for both animals rolled over and lay motionless. The cow was inspected first, and proved to be dead, but on getting within twenty yards of the young bull he scrambled to his feet and charged. A hurried shot aimed at the nose hit the base of his left horn and glanced off into the air with a loud hum, doing nothing towards checking him in his charge. The second barrel drove a bullet through his nose, chest, and intestines, smashing the heart, killing him instantly, and causing him to turn a complete somersault. His rump hit the writer a heavy blow on the face and brought him to the ground with

[*Photograph by Radclyffe Dugmore.*

HERD OF BUFFALO IN DONGA SOBAK.

a bloody nose and cut lips. The incident probably occupied no more than ten or fifteen seconds; but it seemed longer to the writer; and ever since then he has been very careful, when walking up to an apparently dead buffalo, to do so from *behind* the animal. In this case the first shot of all (which brought it to the ground) was found to have struck forward of the shoulder, grazing the vertebræ of the neck, and causing temporary paralysis, without otherwise injuring the beast.

Weapon.—The rifle used in this instance was a double ·500 bore Express, carrying the long 570 grain soft lead solid bullet and 120 grains black powder. It is the best weapon for general purposes, but hardly heavy enough for the larger descriptions of African game. The rifle most suitable for buffalo is the ·577 Express, using 6 drams of black powder and a solid 648 grain soft lead bullet. The 10-bore Paradox gun is also an effective weapon in bush country where shots of no greater distance than 70 or 80 yards are likely to be called for. Nothing of less calibre than the ·500 bore should be used on buffalo; and it is scarcely necessary to remark that the use of hollow bullets is dangerous on these heavy and thick skinned animals.

Stalking.—When stalking buffalo, the hunter should always endeavour to reach a position from which he may obtain a fair broadside shot, and then put his bullet *rather low down* immediately behind the shoulder. This is the most effective shot, and indeed the only one almost certain to be fatal; but it frequently happens that natural obstacles, such as tree stems, grass, &c., prevent the hunter from getting a sight of anything but the head and neck. The neck shot may then be attempted, if the animal is standing broadside (or nearly so) to the hunter, but caution must be exercised in approaching it thereafter, although it may have dropped instantly to the shot, for a bullet in the neck is seldom fatal unless the vertebræ are broken.

Habitat.—Until recent years buffaloes were to be met with in vast numbers all over Southern and Eastern Africa, but the advance of civilisation has caused their gradual disappearance from Cape Colony, Natal, and the greater part of the Transvaal; while in South, Central, and Eastern Africa they have been greatly reduced in number by the outbreak (in 1890) of an epidemic disease closely resembling anthrax, which rapidly decimated the vast herds which, up to that date, were to be found in those districts. Two years subsequent to the appearance of this disease (viz., 1892), when a railway surveying party were at work in the Kilimanjaro district, no buffaloes were seen or killed by the hunters attached to the expedition, but the ground was thickly strewn with the skulls of those which had succumbed to the epidemic. It is to be hoped that the disease has not penetrated to the more northerly districts of German East Africa, and that a sufficient number may have been left there to ensure the eventual restocking of the districts which have been ravaged by it; but many years must elapse before the hunter can again encounter vast herds of these noble black cattle similar to those which until 1890 roamed at will through the swamps and high grass of this part of Africa. A few herds are still in existence in the bush country adjoining the sea-coast near Port Elizabeth. These are protected by the Cape Government, permission to kill a limited number being occasionally given, but the bush is so dense and the animals so wary that it is difficult to obtain a shot.

In the Transvaal only a few small herds are to be found along the banks of the Olifants and Limpopo Rivers, and it is probable that they will continue to exist for some years to come, as they keep to the Tse-tse fly district, and are therefore free from molestation by Boer skin-hunters, who never hunt on foot, and are of course unable to take their horses into the fly country. In North Matabeleland and Barotzeland buffaloes still exist in considerable numbers, and in fact all along the Chobé and Zambesi Rivers herds numbering up to two hundred are met with; but it is in the low, swampy country adjoining the coast line between the mouths of the Zambesi and the Limpopo that they are still to be found in herds numbering occasionally as many as one thousand animals. The district around Beira (in Portuguese territory) is without doubt the finest hunting ground in Africa for buffalo, and indeed for almost every description of African big game.

The country is, for the most part, covered with dense grass from seven to ten feet high, which makes it almost impossible to see the game until close upon it; but open spaces occur every now and then on which the grass is short and sweet. It is upon these open glades that the game is to be found feeding in the early morning. As soon as the sun is up the buffaloes and antelopes retire into the shade of the high grass and palm trees, and it is then difficult to see or approach them.

Arrangement of Trip.—One of the flat-bottomed boats obtainable in Beira makes a fairly comfortable home. The hold is divided into a forward and an after cabin, the former being used by the crew, and the latter by the members of the shooting party. There is room to stow a large number of trophies; and the great expense entailed by the large number of carriers required for a trip by land is saved. Such a boat can be hired in Beira (inclusive of crew's wages) for £35 a month; whereas the wages and food of, say, sixty native carriers required for a purely land trip would amount to £80 a month. The Pungwé River is navigable in a flat-bottomed boat nearly as far as Sarmento, a distance of one hundred miles from Beira; but it is unnecessary to push so far up stream. At 'Mpanda (fifty miles up the stream from Beira) the river divides, the right-hand stream being named the Madinguedingue, and the left the Pungwé. These streams again unite about twenty-five miles further north, thus enclosing a large tract of flat swamp land which is full of Buffaloes and other game. The Urema River joins the Madinguedingue ten miles above 'Mpanda, but is too shallow for navigation in a large boat. By means of canoes (which can be hired at 'Mpanda) it is possible to ascend the Urema River, and so reach Barrato's Kraal (distant about forty miles from 'Mpanda), and from there the Lake Sangue district can be hunted. Here buffaloes (and, in the months of September, October, and November, elephants) are to be found in vast numbers. Barrato is a half-caste Portuguese, and chief of a large native tribe. He is hospitable to Englishmen, and generally willing to give them permission to shoot in what he considers his territory. He has fifty or sixty native hunters armed with good guns engaged in ivory hunting; and when staying at his kraal in 1894, the writer saw about 1,000 lb. of ivory which had been brought in by these men during the previous hunting season. Buffalo and other game are numerous also along the Busi River, up which a trip could be made by boat from Beira. The country lying on each side of the Sabi River (which runs into the sea about sixty miles south of Beira) is also good buffalo ground.

The whole of the country above referred to—viz., that lying between the mouths of the Limpopo and the Zambesi Rivers (roughly four hundred miles of coast line)—is within the Tse-tse fly belt; so no domesticated animals can be employed, and all stores and baggage have to be carried by native bearers; while the European sportsman has to walk every inch of the way. It is also the most unhealthy and worst fever country on the East Coast. Sport is therefore attended with more hardships and sickness than in other parts of Africa; and it is to be hoped that by reason of the deadly climate and the difficulties of travelling through such a country, it may long remain, as it is now, the finest Big Game preserve in the world. During the rainy season no European could survive the dangers of the climate, and it is only in the months of August, September, October, and November that it is possible to travel through the country. The date of commencement and the duration of the dry season are very uncertain, but the probabilities are that at some period during the four months referred to, the grass will be dry enough to burn; and when this is possible, grand sport may be obtained. Within four or five days, after the heavy grass has been burnt off, the young green blades shoot up, and the game flocks in from all directions to feed upon it. They are then easy of approach under cover of the unburnt grass and scrub.

A. M. NAYLOR.

BUFFALO, INDIA.—The vast tracts of swampy jungle at the foot of the South Eastern Himalayas, the Delta of the Ganges, and the plains of the Central Provinces, drained by the Mahanadi and its tributaries, comprise the districts which the Indian Buffalo (*Bos bubalus, vel Bubalus arni*) frequents.

The wild animal differs but slightly in appearance from his tame congener. He looks plump and well cared for, instead of being lean and scraggy; and his nice brown coat and tidy white stockings, as compared with the patchy tints of so many of the domesticated kind, only mark the difference between the free man and the slave.

The usual habitat of the wild Buffalo being swampy ground covered with tall reeds, they are chiefly hunted on elephants; and the density of the cover may be imagined when (as the writer has sometimes experienced) the sportsman, standing up in his howdah, can see nothing of the elephants on either side of him, though only some fifteen yards away, the top of the reeds being higher than his head.

Buffaloes roused by a line of elephants frequently show fight, a solitary bull, or a cow with a young calf, being especially pugnacious; the bulk of the animal and the short range at which the action is fought (generally fifteen to twenty yards) render effective shooting fairly easy, particularly with staunch elephants; but large-bore rifles, taking heavy charges, should be used for these as for all other thick-skinned game.

An occasional stalk on foot may sometimes be indulged in, where broad sandy river beds divide the masses of heavy cover, as buffaloes frequently come out on to these to drink and wallow in the clear water. As, however, a wounded beast invariably betakes itself to the thickest cover near, elephants are necessary to follow it up and bring it to bag.

INDIAN BUFFALO.

Height at shoulder, 5 ft. Av. horn meas. 55 in.; max. horn meas. 77½ in.

On the plains of the Central Provinces the grass during the hot weather is less dense; and as a great deal of it is regularly set on fire by the villagers every year to produce better grazing, buffaloes may be regularly hunted on foot without the aid of elephants. Water at that time is scarce, being only found in pools along the river beds, and the game is consequently confined to its vicinity. Good trackers are indispensable for this sport, and, given these, the best thing that the sportsman can do is to interfere with them as little as possible; they should be allowed to go ahead and carry on the trail, the sportsman remaining fifty or a hundred yards behind them till the game is sighted, when they should be placed in safety, and the hunter undertake the action. The chief reason for this mode of procedure is that few Europeans have the keen senses of sight and hearing that jungle-bred natives possess; their movements are also attended with a certain amount of noise, and their presence tends to distract the trackers, who have not the smallest intention of blundering into close quarters with a dangerous animal, and to whom every sign and sound are of the gravest importance. Naturally this only refers to tracking an unwounded animal, as, after a beast has been fired at, the trackers must be accompanied by and protected by the sportsman.

Buffaloes thus tracked, and stalked in the early mornings while they are feeding, seldom give much trouble; they are fairly easy to approach. Usually a deliberate shot may be obtained at about fifty yards' range, and a heavy bullet, well placed, knocks the fight out of them at once.

A single bull is always easier to tackle on foot than a herd, as the smell of blood from their stricken comrade may, and very likely will, make them charge *en masse* if they happen to detect the firer. Forsyth in his delightful book, *The Highlands of Central India*, gives a vivid account of how he and his gun-carrier had to effect a retreat on account of the threatening demeanour of a herd whose leader he had shot. "A semicircle of pawing hoofs and snorting nostrils, surmounted by forty pairs of monstrous horns," was certainly formidable odds against two men in grass three feet high. When, however, he opened fire again from a more secure position, the buffaloes seem to have made no attempt to attack, but took to flight after a few shots had been fired at them. Williamson, in his *Oriental Field Sports*, written at the commencement of the century, narrates many quaint adventures with buffalo, which he held in great respect; but it must be remembered that there is a considerable difference in power between the ball guns of those times and the heavy rifles of the present day. He gives a capital account of hunting buffalo from boats, during the inundations of the Ganges. He describes the hunters as a motley gang of villagers, armed with matchlocks, swords, and spears, mobbing in the water the various animals that had taken refuge on the islands which were gradually being submerged. The buffaloes, from his account, appear to have been almost harmless, as long as they could be enticed into water deep enough to hinder them from lowering their heads to use their horns.

This sport in a higher form has on several occasions been enjoyed in the Sunderbunds, or Delta of the Ganges, during the rainy season. The sportsmen usually engage a large boat to live in, with small boats attached, in which they are able to follow the smaller watercourses, and so penetrate a considerable distance among the swamps and islands that buffaloes frequent. The sport is described as magnificent, wounded buffaloes often charging up to the boats, and requiring heavy metal and straight shooting to stop them.

But the writer has never heard a single instance of one of these parties having escaped malarial fever, and usually the expedition has been forced to return after a brief sojourn in that deadly district, paradise of sport though it be. The absence of wholesome drinking water is the chief cause of jungle fever, and though the Europeans may escape fever by taking extraordinary precautions, their native servants are almost sure to be attacked by it.

R. Heber Percy.

BULLS AND BULL-FIGHTING.—Although Bull-Fighting is not a sport in which Englishmen commonly engage, it may fairly, as the national pastime of more than one European country, claim a place in an Encyclopædia of Sport.

From the time when the young bull is tended on Andalusian plains to the closing moments of his life in the National *Corrida*, a vocabulary of special words, a separate form of expression, illustrates the science of all pertaining to *Tauromachia*. In Spain these terms form part of current expression, as the bull-fight forms part of current existence, even without penetrating to the inner life of "the fancy" where a language half gipsy, half slang—rich and racy as you please—is the medium of the Matador and his *entourage*. For the hybrid lingo of this set no equivalent could be found, but for some technical terms of the art it is necessary to give a fairly accurate rendering. This, when possible, will be attempted.

The river Guadalquivir after passing Seville forms between its different channels the islands known as Isla Mayor and Isla Menor, and these islands are in their turn subdivided into the far-stretching plains of Las Cabezas and Lebrija. It is from the fine herds of fighting cattle specially bred on these plains that the bull-rings all over Spain are principally supplied. On the adjacent *vegas* of Utrera are the herds of Muruve and Miura, this last of singular ferocity and sinister reputation. Three times in recent years have *Toros de Miura* overmatched their foes. Thrice has the life-blood of Matadors mingled with this *sangre fiera* in open fight. The classic arena of Madrid bore witness to their death-dealing horns, when the Cordoba man José Rodriquez (Pepete) fell, to be followed later by Mariano Canete. The shock which galvanised the public there on the 27th of May, 1894, when poor Espartero died, seemed for long to thrill all Spain, for he was a universal favourite. Besides the Seville owners there are breeders in various parts of the country. The bulls are kept separate from the cows in enclosed pastures, each calf (male or female) being given a name at birth and entered in the herd-register. When the calves are a year old, the branding process takes place. This forms almost as important an epoch as the trials for courage which take place later on. It is a rural festival, and a kind of open house is kept at the ranch during the two days it lasts. A year passes, or even two, before any further steps are taken with the young stock. In some herds they are tested at two, in others at three years of age. The separation has then to be made between the good and the bad, or in other words "the cowardly and the courageous";

those which the overseer passes as good return to their pastures, while those found wanting are condemned to the slaughter-house or the plough-share. This *tentadero* is again a *fête,* crowds appear, the amateurs are now expected to take an active part, and he who would pose as a sportsman must be more than a fair rider and bestride a speedy nag well broken to the work. With the assistance of a number of trained oxen (each carrying a large bell), the youngsters are herded up on the plain, which extends as far as the eye can reach, and offers no impediment to a race between mounted men and themselves. Half the "decoy" cattle are then removed from the mass and rounded up at some few hundred yards' distance. The owner, overseer, and his friends, each wielding a heavy wooden lance, called a *garrocha,* some twelve feet long, with short blunted metal point, similar to that used in the bull-ring, rein up their horses for a start, with them being also a professional spearman (*picador*). On a given signal, the herdsmen who are surrounding the beasts to be tried, allow one of the animals to escape, whereupon he or she, for the two sexes are tried indiscriminately, makes headlong for the distant group of tame kine. Immediately two spearmen urge their horses in pursuit, one lying on either side, and each riding hard to get in first lance; he on the right endeavours to place his spear, if one may call it such, on the bull's right flank, and he on the left *vice versa.* If successful, the bull is thrown to the ground; he rises, again to start, and once more to be overthrown; then, infuriated, he turns to face his pursuers. These give way to the professional spearman, who, with couched lance, awaits the onset. The beast charges repeatedly if he be of the right sort, each time baffled and kept at spear's length, as the metal point fixes in his withers. It is at this critical moment his fate is decided. By the number of times he faces the spear, so is his merit recorded. An inferior or soft animal will refuse, or charge but once, the pluckier ones attacking repeatedly. The whole herd is tried in the same manner. The horsemen, mostly friends of the owner, take their turn in pairs to wield the lance. Bad falls are not infrequent.

The ordeal to which the young bulls are subjected is sometimes even further extended by men on foot giving them *pases.* To "pass" a bull is to induce him to charge by holding open before him some coloured material, which may be a rug, a cape, or something similar. As a matter of fact, the lures used in bull-fighting are made in the shape of a cape, so that when not in use they may be worn by the expert. When the bull lowers his horns in the charge, the texture is cast on one side or the other, the bull follows it, and the man is safe. A bull will be brought to the charge several times before he tires of the intangible result. Many breeders condemn this practice, and consider that no bull should be "cheated with the rag" till necessary in the bull-ring. It is easy to understand that he would learn before long to leave the shadow for the substance. Instances of "educated" bulls, which have been extremely dangerous to the *matador,* are not wanting.

The selected bulls pass two years uneventfully, until at four or five years of age they are ready for the ring. They are now worth £40, £60, even £70 each, according to the reputation of the herd, though bulls for a *novillada* or second-rate bull-fight cost far less. The breeder's liability does not end until the bulls sold are safe in the ring, or in the railway station booked for a distance. In the enclosures or "surrounds," some of which are many thousand acres in extent, curious scenes are sometimes witnessed. Thus, two bulls fight, and the entire herd ring them round to look on. The loser is pursued by the rest, is badly hustled, sometimes killed. Even if not, the beast will ever after be of evil temper; boycotted by the others, he keeps himself aloof from them. This moroseness is also noticeable in bulls which are sick, lame, or wounded. Another curious fact, in an enclosure containing eighty bulls or more, there is always one master of the rest—one Cæsar. This continues till the herd will stand it no more; then six or seven unite, and together attack the tyrant and kill him. The whole herd then surround the defunct and bellow mournfully, until the stockman removes the body.

The enclosure which contains the cows with the calves is very dangerous ground; should you draw their attention, the whole lot will be upon you instantly, and, unless you can put the fence between you and them, you are in a bad way. If caught in the open there is one means of escape, which is to seize a calf, and, keeping it between you and the infuriated cows, to edge back to the railings; as long as you are thus protected, you are safe. In entering an enclosure of fighting bulls always keep near the railing or the riverside, even should they be near the former or drinking in the latter—never pass behind them in such a way as to block their escape. If they should stop and look at you, as they will do after moving a few steps, continue your way and do not stop; barring the sullen, solitary animals mentioned previously, there is no danger of a charge. The better bred they are the quieter they will be in the pastures. When a contractor comes to buy bulls for a *corrida*, or fight, he or his deputy rides through the enclosure with the overseer, and picks out what he wants; these are driven by the stockmen into a separate enclosure by means of the decoy cattle, *cabrestos*, which go with them. They are then driven by easy stages to the town of the fight, following the decoys without a thought of evil, and rest on some pasture in the neighbourhood.

The Opening Parade of Banderilleros, Picadors, and Matadors.

Apart from the bull-fight proper and preceding it by some eight or ten hours there takes place in the same locale a diversion called the *Brandy Bull*. Early in the morning an animal of inferior quality, but possessing most of the attributes of the fighting class, is loosed in the arena. The points of its horns are bound in wooden knobs to prevent loss of life. The public is admitted on payment of a sum equal to about twopence; and any one may jump into the ring and try his hand with a *capa*—that is, draw the attention of the bull to himself. All the rabble of the town is present, and accidents (principally from the throng of people in the ring) are frequent. The bull sometimes gets his horns free, and then many serious wounds are given. After an hour of this baiting, the animal is removed and killed outside. This early excitement puts the people in a suitable frame of mind for the anticipation of the professional contest to take place in the afternoon: as the *corrida* always occurs on holidays, the whole time is absorbed by its ever renewed interest.

With the first morning light the bulls and their "traitorous kin" are roused by shouts of mounted men. Soon the whole herd of bulls and decoys is rattled along the lanes and byways, at a gallop, in the direction of the bull-ring. The horsemen are assisted in this operation, called the *encierro* ("enclosing"), by numerous amateurs. As the ring is approached, the road is enclosed by strong post-and-rail fencing. At the end of this open the wide doors of the *toril*, or circular corral surrounded by high solid walls. Through the opening rush the herd, *cabrestos* and *toros* together. The wide door swings to, and all are safe. A passage leads from the corral to the bull-ring, and one by one the animals are admitted to this section. Doors swing conveniently open before each *cabresto*, and he walks quietly to liberty without, free to betray once more. An equally convenient door opens before each bull, but not to liberty. Snorting and panic-stricken, impatient of control, he follows the opening way. Onward through secret panels till he can go no further—a bolt is drawn, a wall falls behind, and he is caught. Between his cell and the arena there is but a board.

The arena, or *redondel*, may be seventy yards across or less. A barrier of wood about six feet high encircles it; then comes a corridor of seven feet, round which the first circle of seats are ranged. These are the places sought by the foremost patrons of the sport. The space between the two circles is called *entre barreras* ("between barriers"), and here in this corridor the bull-fighters not actually engaged in the fray stand at rest; it is here also that the police and the military have their representatives. So, when a bull jumps the barrier, as frequently happens, an amusing *sauve qui peut* occurs. Then the track is closed by throwing a section of the inner barrier to the outer circle, forming a stop. The bull is thus compelled to return to the arena. Some rings are provided with upright screens of wood called *burladeros*, placed at intervals close to and flush with the barrier—a refuge for the experts when hard pressed. From the first row of seats, or *tendidos*, the lines rise in widening circles back to the enclosing walls of the *plaza* or bull-ring. All is open to the sky except on the shady side of the amphitheatre, where a roofing covers the privileged seats at the top, the boxes and presidential balconies; as the spectacle usually takes place in the afternoon, no inconvenience in this quarter is caused by the sun's rays. The composure of the *élite* in the boxes, where the bride-like costumes of the ladies give a strange refinement to the scene, indeed the coolness of all in the shady side or *Sombra*, is strongly contrasted by the close packing of the roaring "people" in the *Sol*. On that side the glare and heat are combated by myriads of fans of all colours. These, mixed with bright mantillas and flower-decked heads, make a blaze of tints, the blue sky over all, not easily equalled. The *Sol* has the life and glow of popularity, the *Sombra* the stamp of fashion, both combining the enthusiasm of the Spanish race.

The equipment for an ordinary *corrida* or bull-fight is six bulls. Two *espadas* or *matadors* are engaged to kill alternately, the elder commencing with No. 1. Each "master" has his own band of assistants called a *cuadrilla*; this troupe consists of four men on foot, known as *banderilleros* or *chulos*, and two horsemen called *picadores*. The sacrifice of horses varies; sometimes only ten suffice; at others twenty or more are required. The cost of an average *corrida* would be approximately one thousand pounds. Each matador is responsible for the performance of his party. The senior takes the management of the ring-details. The word of the chief is law to his followers, who usually have great respect and affection for him. In some cases there are three *espadas* engaged; then two bulls fall to the lot of each.

The total number of spectators varies according to the size of the ring, a fair average being 8,000 seats (that of Madrid contains 12,500).

The assemblage is presided over by persons in authority—in provincial capitals by the civil governor, in smaller towns by the *alcalde* or mayor.

The changes in the spectacle are directed from the presidential chair. When nothing goes wrong, the waving of a white handkerchief suffices for the purpose. A red one is the sign of disapproval.

The fight is divided into three stages: first, the *suerte* or hazard play of the *picadores* or horsemen; secondly, that of the *banderilleros* (men on foot); and lastly, the crowning and principal scene, the *suerte* of the swordsman (*matador* or *espada*). The spectacle commences with a procession of the entire "cast," issuing from the gate opposite to the president's balcony. The *matadors* lead the show, walking in line abreast some three yards apart, behind them in Indian file follow the *cuadrillas*. The *picadores* ride in couples behind. The *espada* of highest fame leads the left wing, and the rear is brought up by two teams each of three mules harnessed abreast in gaudy trappings, accompanied by grooms and attendants. The *espadas* wear their gala capes in stately fashion. These garments are soon to be exchanged for less expensive ones for use in the conflict.

Preceding this imposing parade two *aguacils*, or warders, in sixteenth-century costume ride across the ring and go through the form of asking the president for the key of the bulls. This is thrown from above. The retirement of the *aguacil* with the key is the prelude to the fight. The vast arena is now clear save for the *picadores*, who are ranged some twelve yards apart on the left of the door from which the bull will emerge. Their horses are so placed that, if charged by the bull in his first rush, the impetus will be received on the right side. Each man grasps tight his *garrocha* or lance. There is a lull in the roar of thousands. The fatal handkerchief is waved, a herald trumpets the command to unswing the double doors, and the noble beast bounds to his fate. Encompassed on all sides by glaring moving colour, maddened by all he sees and hears, the call on his ferocity is not made in vain, and fain would be wreak his vengeance on all at once. His eye takes in several victims; hardly can he decide which he will first attack. He swerves in his career from one to another, then darts at one and charges home. The efforts of the *picador* with his lance seldom serve for aught at this first charge; the guard is broken through, and horse and man are hurled to the ground. Frequently the *picador* is jammed between the saddle and the barrier. Then the *toreadors* come to the rescue by trailing capes before the bull, and his attention is taken from the fallen man, who may be within a few inches of his horns. The coloured *capa* takes his eye, he turns to catch it on his horns, then sees another horse and man, and on these vents his fury, usually with the same result as before. The object of the *picador* should be to turn the charge of the bull by firmly placing the point of his lance between the shoulder-blades as he wheels his horse to the left in safety.

BANDERILLEROS AT WORK.

Whatever may be said in answer to those who claim for the second and third sections greater proficiency and skill, the first part (that of the *picadores*) is but a prostitution of the original finished display of horsemanship. It must be borne in mind that the first *espada*, the *matador*, has completely absorbed the interest of the public. He has become the monopolist of *plaza* favour.[1] As two of rival rank are usually performing at the same fight, they are the centre of all eyes, and not infrequently daring competitive efforts are made to draw applause. Thus the *picador* is of secondary interest. The object of the *Suerte de Varas* (lance play) is to tire the bull sufficiently (not too much) to render him a more facile plaything in the use of the *banderilla* and the sword (second and third acts).

As the president (assisted by an expert) gives more or less time to this part of the performance (the *picadores* punishing more severely a strong bull than a weaker one) —wounded horses, terribly wounded horses, are brought up again and again to receive the bull's charge. Only animals unable to bear a man are mercifully brained by the grooms of the ring. After each charge the bull is less inclined to continue the work; then the horses are spurred to where he may be standing, and he is urged to charge again by a movement of the bridle or by shaking the lance. This is called *citing* the bull. It is notorious that the *picadores* do not try to save their horses—poor refuse and cast-offs as they are. The men have direct interest in riding a number to death. The public no longer require them to save the horse; rather are they applauded for taking the risk of the falls, and these are considerable. The fame of the breeder is augmented by many slain, while the *espada* scores by achieving the death of a bull which has killed many horses. Should the bull be of soft description and refuse to charge a third time (which seldom happens), the red handkerchief is waved. *Banderillas de Fuego* (darts with fireworks attached) are then implanted in the bull's withers. This is a terrible disgrace to the herd from which he comes. The *picadores* are fined if they place the lance in any but the proper spot or injure the bull in an unorthodox way.

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[1] As their importance has increased, so has their emolument. A hundred years ago each bull was paid for at the rate of about a sovereign—fifty years ago (in the time of the great Cuchares) at £10. To-day Guerrita or Mazzantini will look askance at anything less than £50 to kill a bull.

All through the *corrida* the cape or *capôte* is ever cheating the bull—the never-failing lure—flaunted, and trailed, fascinating, and fixing his attention. By it the expert stops or directs his charge. Of the two things, the man or the cape, the bull will almost invariably go for the cape. This gives many opportunities for the bull fighter to show off. In it is involved the first principle of bull-fighting. By the *capôte* or long cape the bull is tired and beguiled during the first two episodes. It is by the small red cloak, or *muleta*, that the *matador*, unaided, encompasses his death in the last act. Not infrequently at the *sortie* of the bull, before he has even charged the first horse, a *matador* will face him in the centre of the ring with extended *capôte*. Between outstretched hands he holds the lure well up; when the bull with furious rush appears almost to have caught him, he swings his arms to one side; with unmoved feet and a sway of the body, the folds of the cape are thrown open on the right, the bull bends his head and follows the trail of colour. He stops his charge and turns to seek the phantom anew. Again the cape is stretched—another rush—again the bull is baulked as the slippery silk goes slithering across his horns. This *coup* is called *La Veronica.* The movement called *Navarra* is of similar risk.

Another trick called *de Tijerilla* is of still greater danger. In this exhibition the *matador* has the cape crossed over his breast and held beneath the arms. He has to await the charge and yet free himself and divert the bull's attack. The leap of the lance (*Salto de la Garrocha*) is performed by the expert awaiting the bull in mid-ring with one of the lances used by the *picadores*—as the bull lowers his head in the charge he leaps over him. Another risky performance, seldom seen, is to place the foot between the horns and spring over the bull as he charges (*Salto del testus*). In order that the horses may not shrink from the onslaught, their right eyes are invariably blindfolded. When the president considers the bull has been sufficiently "brought down," the bray of the trumpet heralds the next act, the horsemen retire from the ring, and for a few seconds the bull and the slain are in procession. The *banderilleros*, each with a pair of darts, now advance. The

BULL PREPARING TO CHARGE MATADOR.

banderilla consists of a wooden shaft an inch in diameter and 2¼ feet (or less) in length, covered with bright paper frilling, having at the end a short sharp iron barb. By waving these at arm's length aloft, the *banderillero* cites the bull to charge. As the bull lowers his head to gore his tormentor, the darts (one from each hand) are deftly implanted between the shoulder-blades, as nearly touching one another as possible, the man reaching over the horns in the act. At the same moment, by a graceful movement of the body, he avoids the beast's thrust. This is doing the "turn" well, and indeed a quick and careful calculation of distance is necessary; so much so, that a start with the wrong foot might easily be fatal. The different modes of "putting in the darts" may be divided into two forms: first, awaiting the bull face to face; and second, coming up from behind, when the bull receives them in the act of turning to charge, and before he actually has time to do so. Each form embraces a variety of *coups*, though, it is needless to say, the best is the face-to-face system. To go into these and other details would require a volume. With the smart of the first pair of *banderillas* the bull roars with fury, and bounds hither and thither, frantically trying to rid himself of the unwonted encumbrances, the shafts of the *banderillas* falling and rattling on his horns to and fro, but firmly attached by the barb, which only pierces skin deep. While in this state he presents a more favourable mark for the second *banderillero*, who fixes with greater ease a second pair; this is called putting in a pair *al relance* (on the rebound). The darts are usually fixed by the *chulos*, but on some occasions the public demand that the *matadors* themselves should do this. By an almost universal custom, the *matadors* affix the darts in the fifth bull. This is always the pick of the six, and hence comes the Spanish proverb "No hay quinto malo," the fifth is ever good. Should only one dart remain sticking, or the pair be badly placed, the public express their disapproval by loud whistling (as in all cases of bungling or cowardice). Four pairs of *banderillas* sometimes decorate a bull before the *séance* changes. Should the beast advance at a trot, he affords no chance, and the *banderillero* must escape to the barrier and wait a better opportunity. Herein lies a fruitful cause of accidents, as he has then no *capôte* for defence, and must trust to speed or his comrades' *capas* to draw off the bull.

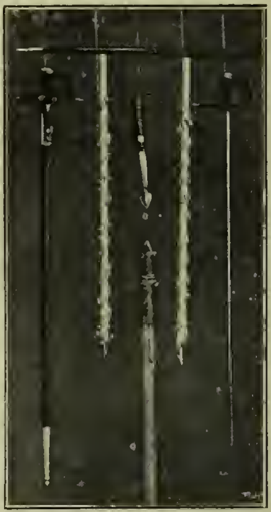
MATADOR PREPARING TO GIVE THE "COUP-DE-GRACE."

A feat introduced by El Gordito, and since emulated by a few others is the "hazard of the chair" (*Suerte de la Silla*). The *banderillero* takes a cane-bottomed chair to the centre of the ring, and, seating himself, awaits the charge. On this taking place he swiftly "plants" the darts and glides to one side, the bull meanwhile tossing the chair on high; this looks very effective. But to resume; the trumpets sound once more for the third and great scene, and an expectant hush falls on the vast gathering as the *matador* steps alone into the arena, and approaching with stately stride beneath the presidential stand, makes an impromptu speech, of which the following may be quoted as an example:—

> Your Grace, to you, this bull I pledge
>   To slay, and stake my life,
> Whereof in token, here's my badge
>   Ere ent'ring on the strife.

Then, turning sharply on his heel, he casts his *montera* or betasselled cap behind him defiantly, sworn to do or die. Slowly he advances to the bull, grasping in his left hand the *muleta* or small red cloak, a hole in the centre of which admits one end of a short stick for the better extension of the cloth; and in his right the long, rapier-like sword. As he steps out, his wiry and athletic form is well shown up by the bright silken attire of faultless fit, gleaming with gold or silver embroidery and precious stones. At a distance stand his satellites, their *capôtes* ready in case of need. By the *muleta* the bull is induced, with his eye constant to the lure, to charge again and again, the *matador* "passing" him now on one side, now on the other, till the panting animal stops in wonder. Raising and depressing the *muleta,* the man observes whether the beast is still obedient to its influence. All this time he has been studying the bull's peculiarities, for on this much of his success depends. When the bull assumes a suitable angle and position, the *matador* raises his sword shoulder high, takes a steady aim, and makes his running lunge (that is, in the case of the *Volapié*—see later). If successful and rightly placed, the bull falls dead, the sword left in to the hilt. The spot aimed at (just in front of the withers) is only a few inches in size. A small deviation is sufficient for failure, and the bull may require several thrusts; to kill the beast with one counts the highest merit, that is, if properly administered, though thrusts are reckoned good, even if the bull is not killed, provided they are well placed, as the bone often obstructs the sword. The following are the lunges or thrusts of the *matador*:—

The Matador leaving the Ring after Despatching a Bull.



Bull-fighting Weapons.

Sword. Point of a lance.
Banderillas. Wand of a *muleta.*
Braining dagger.

Good.

Recibiendo or *Aguantando.*—Receiving the bull's charge, *matador* motionless, only swaying body to avoid horns.

A un tiempo.—Both bull and *matador* meet midway.

Volapié or *Vuelapies.*—The usual method —the bull steady, *matador* kills with running thrust.

Inferior.

A paso de banderillas, Al revuelo de un capôte, Al relance, A la media vuelta.—When the bull is taken in motion on half turn (four variations).

Bad.

Mete y Saca or *Metisaca.*—A defective stroke used only with cowardly bulls as a last resource—to kill without regard to rules, care being taken to remove the sword to avoid bad impression.

The *matadors* are recruited from the *banderilleros,* but the *picadors* always remain *picadors.* An interesting ceremony is sometimes to be witnessed in a large ring, when a first-class *matador* elevates a junior colleague to the highest grade. To do this, instead of killing the first bull, his by right of seniority, he formally hands *muleta* and sword to the aspirant, who, having achieved the feat, is ever afterwards of premier rank. This is called "taking the alternative."

The prominent *matadors* of recent years are the following: Bocanegra, El Gordito, Chicorro, Lagartijo, Frascuelo, Angel Pastor, Mazzantini, Espartero, Guerrita, Reverté, Bombita, Lesaca, El Algabeño. Each of these was or is the exponent of a particular school. (In *Wild Spain*, by Abel Chapman and myself, readers will find some account of the Bull Fight as it was in the old days and of the earliest professionals in the art.)

In Portugal a popular spectacle prevails—a so-called Bull Fight, which, however, partakes more of the nature of a circus entertainment, and is consequently held by Spaniards in very low esteem. In these shows a variety of feats are gone through; the *banderillas* are "put in" as in Spain, but some of the other tricks are of the clown order; one skilful performance deserves praise—a humane adoption of the Spanish *picador's rôle* accomplished by skilful riders mounted on well-trained horses, which, indeed, is well worth seeing. Finally, when the bull has given sufficient amusement the *cabrestos* are driven in and the beast makes its exit with them. The Portuguese Bull Fight, though presented in a Spanish setting, differs almost entirely in its execution, as the risk to man or beast is small, owing to the round wooden knob which covers the point of either horn.

WALTER J. BUCK.

VOCABULARY OF WORDS REFERRING TO BULL FIGHTING.

Aficionado.—An enthusiast, a devotee.
Aguacil.—A mounted official, a messenger.
Anillo (or *Redondel*).—The arena.
Arrastre.—Dragging by mules the slain animals from the arena.
Banderillero.—Expert who places darts or *banderillas* in the bull.
Barrera.—Wooden partition encircling arena.
Becerro.—A bull calf.
Burladero.—Screen for safety or refuge in arena.
Cabrestos (or *Cabestros*).—Tame cattle used in removing bulls.
Capa (or *Capôte*).—Cloak, cape, mantle.
Capeador.—An expert with the *capa* or cloak.
Castigo.—Punishment inflicted by the lance.
Chiquero.—Cell or cage for the bulls.
Chulo.—An assistant bull fighter.
Cojido.—Caught, overcome.
Coleta.—Plait of back hair worn by *toreros.*
Cornada.—Thrust or wound of a bull's horn.
Corrida.—A bull fight.
Cuadrilla.—Troupe or following of a *matador.*
Descabello.—Act of braining the bull with a sword, sometimes permitted.
Desecho.—Inferior, discarded.
Diestro.—An expert, a professional.
Divisa.—Rosette sometimes placed on the bull.
Embolado.—Bulls' horns thus described when points are covered.
Encierro.—Enclosing bulls in the ring (*toril*).
Engaño.—Lure, deception. Applied to bull fighter's cape.
Entrada.—Fee for entering the bull-ring.
Entre-barreras.—Between the two barriers round arena.
Ganaderia.—A herd, or breed.
Garrocha.—Heavy wooden lance with short iron tip.
Gitano.—A gipsy.
Humillar.—Lowering of the bull's head to toss.
Jurisdicción.—When the bull is within striking distance of the expert he is said to be *à jurisdicción.*
Lid (*Lidia,* or *brega*).—Action or turmoil of the bull fight.
Matador (*espada, toreador*).—The chief bull fighter, he who kills the bull.
Moña.—Round padded ball worn at the back of the head by the men during the fight.
Monos sabios.—Boys and men employed in the service of the bull fight.
Montera.—Cap or headgear worn by all except the horsemen (*picadors*).
Muleta.—Small cape without collar used by *matador* on killing the bull.
Novillada.—An inferior bull fight, in which the animals are young or defective.
Nòvillo.—A young bull.
Pase.—Action of passing the bull from one side to another by using the *muleta,* or small cape.
Paseo.—Parade of the bull fighters.
Picador.—Horseman armed with lance.
Pinchazo.—Half completed sword-thrust.
Pinta.—Colour or marking.
Plaza.—The bull-ring building.
Puntillero.—He who ends the bull (if necessary, after the *matador* has given a mortal wound), by using a braining dagger.
Quiebro.—Movement, twist of the body.
Quite.—Act of enticing bull from fallen man with cape.
Rejon.—A kind of dart or spear.
Res.—An animal, applied to a bull.
Sol.—Sunny or cheap side of ring.
Sombra.—Shady side of ring.
Suerte.—Fashion, mode, form, hazard, attack.
Tablas.—First wooden barrier round the arena.
Torero.—A bull fighter.
Toril.—Yard enclosing bulls on their arrival at the ring.
Toro bravo.—A fighting bull.
Trastos.—*Matador's* tools (sword and small cape).
Vaca.—A cow.
Vaquero.—A herdsman.
Viaje.—A movement or course taken by bull in the ring.

BURREL —The Burrel, Burrell, Burhel, Bharal, or Blue wild sheep. *Ovis nayœur,* Hodgson, *Asiatic Rev. XVIII.*, pt. ii., p. 135 (1833); *Ovis nahoor,* Hodgson, *P.Z.S.* 1833; Sclater, *P.Z.S.* 1860; *Ovis nahura,* Blyth, *Cat.*, p. 178; Jordan, *Mam.*, p. 296; *Ovis burhel,* Bluth, *P.Z.S.* 1840, p. 67.

Native Names.—*Na, Sua*; Ladak. *Wa, War*; Sutlej valley. *Nirvati*; Nepaul. *Nao, Gnau*; Bhotan.

Measurements.—Height of full-grown male, 30 to 36 inches, being considerably shorter than Ovis ammon, and of a stouter and less graceful build.

BURREL.
Height at shoulder, 36 *in. Av. horn meas.* 22 *in.*; *max. horn meas.* 32 *in.*

Horns, &c.—Average length, 22 to 24 inches; girth at base, 11 inches. Hodgson records a pair of 32 inches: *P.Z.S.* 1840, p. 66. The horns are moderately smooth, with a few wrinkles, and are of a peculiar shape. They are set on the head close together and spring at first outwards in a rounded arch from the head; the points then curl backwards, outwards, and upwards in a manner unlike any other head unless it be that of the Caucasian burrel or the Pyrenean Ibex. The head is somewhat coarse and distinctly sheep-like. No mane or ruff. Ears short, No sub-orbital glands or lachrymal fossæ; but feet pits are present in all four feet.

Colour.—Brownish-grey in summer: slate-grey in winter. The lower parts, inside of limbs, and buttocks, white. The male has black face and chest; a black stripe down the front of the limbs and along the side of the body. The female is much smaller and insignificant in colour, with rudimentary horns.

Distribution and Habitat.—The Burrel, from a sporting point of view, is an example of the blessings of mediocrity. He has an enormous range. He inhabits practically the whole of the higher portion of the main Himalayan range, from Shigar in Baltistan to Sikkim and Bhatan, together with an indefinite range of country to the North as far as the Yarkund country, the Kuenlan, and the Altyn Tagh (Prejwalski). Much of this country is open to the sportsman; the Burrel is not a very difficult animal to find if patience be exercised; nor is he, as a rule, on ground which presents very great difficulties to an experienced stalker. On the other hand, his head, though handsome, is not a very striking trophy, and as he usually dwells within ken of Ovis ammon or Ibex, the average sportsman does not devote the whole of his time and energies to stalking Burrel, but generally hopes to obtain a head or two on his way to or from the home of superior game. At the same time, Burrel show very pretty sport. They live upon the highest ground, being seldom found in summer lower than 10,000 feet. Much of the best ground is above 17,000 feet. The pursuit of Burrel, therefore, requires sound heart and lungs, besides mere leg power. At times, owing to the colour of the base rock on which they are lying, and to the indescribable "mirage" of a Ladak summer's day, they are very difficult to spy. Old-time sportsmen have described them as being not easily alarmed. Wilson and Kinloch both relate instances of most confiding behaviour on the part of Burrel in remote districts. Nowadays, it is safe to say that the Burrel, like all wild sheep, has remarkably acute senses of sight and smell, and takes the fullest advantage of both, as well as of its powers of speed and endurance, in order to secure its own safety.

Shooting.—Like other wild sheep, too, it is very tough to kill, and requires to be hit in the right place. A good Balti dog may be a useful addition to the party. Ward in his excellent *Guide to Kashmir and Ladak* mentions a case in which a Balti dog cornered a wounded Burrel under a rock and lay out all night watching it, till the sportsman returned with the daylight to put in a finishing shot. This happened in 1881, and a few years later the story was confirmed to the present writer by the owner of the dog.

In some aspects the Burrel is allied to the goats as well as to the sheep. Hodgson at one time classed him as a *Pseudovis*. His horns have a peculiar twist which suggests the goat, and have a strong resemblance to the Caucasian Burrel (*Capra pallasi*), and also to the Pyrenean Ibex.

On the other hand, he has no beard and no caprine smell. Indeed, one of the best points about the Burrel is his mutton, which is excellent. Unless it be his congener, the Big-horn of the Rocky Mountains, few animals can supply a better joint than the saddle of a fat Burrel ram, not too young, killed in September or October.

S. H. WHITBREAD.

BUSH PIG (*Potamochœrus africanus*).—The *Bosch Vark* of the Boers, sometimes called the **Southern River Hog,** is found in various regions of Southern Africa, usually in the neighbourhood of thick bush and forest. It seldom wanders far from water, and is, therefore, not known in many parts of the dry interior of South Africa. In the bushy parts of the midland and eastern provinces of Cape Colony, and in Natal, Zululand, the Eastern Transvaal, and the jungly regions of South-eastern Africa, it is not uncommon. It is found sparingly in Matabeleland and Mashonaland. In height, the bush pig stands about 2 feet 4 inches or 5 inches. Its extreme length, from snout to tail-tip, is rather more than 5 feet. The general colour is reddish-brown, mingled with grey. The body carries a great deal of coarse hair, especially upon the back and neck. The ears are long and strongly tufted with bristles. The tail, which is about a foot in length, is also strongly tufted. The tushes resemble those of the wild boar of Europe. The canine teeth are all strong and pronounced. Upon the chaffron is a remarkable bony excrescence. The bush pig is, from its extremely shy habits and the difficult nature of the jungles in which it secludes itself, not often bagged by the white sportsman. It is, however, occasionally shot in the periodical drives for small antelope organised in the bush-veldt country of South and South-East Africa. The flesh is fairly good. The **Red River Hog** of West Africa is a near ally, and, although much more brightly coloured, strongly resembles this wild boar in appearance and habits. Other species of bush pig, all allied to the South African form, are found in various parts of the continent.

BUSH PIG.
Height at shoulder, 28 *in.* *Length* 60 *in.*

H. A. BRYDEN.

BUSTARD.—Thirty species of Bustard, separated into twelve genera or imaginary groups, have been described; we are content to omit these perplexing names and refer them all to the typical genus *Otis*. (The numerals given below after the specific names represent the average length in inches of the males, and serve to show the proportionate size of each species.) In most the males are much larger than the females, but this is reversed in the **Floricans,** the females being the larger. Of the thirty different Bustards, two, the **Great Bustard,** *O. tarda,* 42, and the **Little Bustard,** *O. tetrax,* 17, are resident in Europe, Central Asia, Persia, and North Africa.

[*Photo. by W. S. Berridge, F.Z.S*
GREAT BUSTARD.

Five are Asiatic, and four of these, *O. edwardsi,* 50, the **Bengal Florican,** *O. bengalensis,* 25, the **Lesser Florican,** *O. aurita,* 19, and the **Eastern Ruffed Bustard** or **Houbara,** *O. macqueeni,* 28, are resident in India, the last-named, occasionally wandering to Europe, has been obtained in England. One Bustard, *O. australis,* 48, very similar to the Indian *O. edwardsi,* is peculiar to Australia, and known to Colonials as the **Wild Turkey.**

Twenty-two species are resident in Africa, one of which, the **Western Ruffed Bustard** or **Houbara,** *O. undulata,* 28, occasionally wanders to S. Europe, and is found in the Canary Islands; twelve of the others are S. African, including the largest, the **Gorri-Paaver** of Colonists, *O. kori,* 50, and the **Koorhaan,** *O. afra,* 19.

Bustards are unknown in the American regions. The **Great Bustard** was formerly resident in England, the last of the British race being killed in Norfolk in 1838. Since then occasional visitors appear, generally in winter, and several efforts, which have, unfortunately, proved unsuccessful, have been made to naturalise them again. Always frequenting open country, this fine bird is found in great numbers on the vast plains of Andalusia, where sometimes flocks of as many as seventy may be seen. The best, but not, perhaps, the most sporting, way of shooting them is by driving, usually in spring. It is difficult in some parts to find any shelter for the guns. Where there are dry watercourses it is, of course, easy work, and in May the wheat is high enough to squat behind, while in some spots it is necessary to make screens of dead thistles and other rubbish. On suitable ground, the gunner can lie flat near the top of the reverse side of any slight hill over which the birds are to be driven. The chief object is to keep perfectly immovable, for no bird has a keener sight than the Great Bustard, and the faintest movement will send it swerving.

[*Photo. by W. S. Berridge, F.Z.S.*

LITTLE BUSTARD.

It is usual only to shoot the males; the old ones, sometimes weighing up to 36 lb., are called by the Spaniards, "*Barbones,*" from the tuft of long bristly white feathers which grow like whiskers on each side of the throat.

These Bustards usually fly very low, within twenty yards of the ground; but, with the wind behind them, much higher. Considering their size they are easily brought down; No. 4 is quite large enough shot to use, but, wonderful to relate, I have seen good shots clean miss them within twenty yards, perhaps because, from their apparently laborious flight, they seem to fly more slowly than is really the case.

When they do not fall to the shot they always, if mortally wounded, void their excrement.

The drivers need not be numerous. The best driver I knew, one "Perico," or Pedro Molina, of Algaba, a village on the Guadalquivir, a few miles above Seville, never used more than two men to assist him as flankers in driving, but his knowledge of the country and consequent judgment of the course the birds would probably take were wonderful. The late Lord Lilford (*Birds of Northamptonshire,* vol. i., pp. 342-4) gives a graphic account of Perico, under whose guidance both he himself and the writer shot their first Bustard many years ago. Bustards are also shot in the hot months by the Spaniards at drinking places; but they kill most at night in the way adopted for many small ground-roosting birds, viz., with a lantern and bell. With the Bustards, however, a horse and gun are also used, the gunner walking by the side of his horse, while his confederate rings the bell and shows the light, till it shines on the birds, which are then killed, sometimes three or four at a shot.

[*Photo. by W. S. Berridge, F.Z.S.*

MACQUEEN'S BUSTARD.

Another tedious method, a stratagem

practised in almost all countries with Bustards and many other birds, is to approach them with a cart. The most sporting way is stalking them with a rifle, when, if the ground be unfavourable, a shot may occasionally be got by gradually circling round them.

The **Little Bustard,** a straggler to the British Islands in autumn and winter, is also found in Andalusia and Morocco in great numbers, but is a shy and very difficult bird to circumvent. Though usually frequenting more undulating ground than the Great Bustard, I have always found it useless to attempt to drive them, as when flushed they rise at once, sometimes to such a height that unless seen to rise from the ground it would be hard to recognise them. They are also very difficult to detect on the ground, though, when flying, the white of the wings is very conspicuous.

The only season in which they can be easily shot is during the great heat of August, when, at midday, they lie well; but the heat is then too much for ordinary mortals.

Occasionally, without any apparent cause, they will, like Golden Plover, fly past within easy reach, and, keeping very close together, offer a good " browning " shot. Even when nesting amongst the well-grown corn, they are very wary; and I have found it troublesome to obtain specimens.

[*Photo. by W. S. Berridge, F.Z.S.*

HOUBARA OR RUFFED BUSTARD.

When rising from the ground, they make a loud rattling noise with their wings, whence the Spanish name of " *Sison* " and the Moorish " *Bou-zcrat,*" " father of the armourer " ; another Moorish name is *Sirt-Sirt*, from their peculiar call in the breeding season. Their flesh, unlike that of the Great Bustard, is excellent, almost equal to that of the Bengal Florican, and in Spanish hotels figures on the menu as "*faisan.*"

[*Photo. by W. S. Berridge, F.Z.S.*

AUSTRALIAN BUSTARD.

The larger Bustards, which frequent open ground, are wary and difficult to approach, needing all sorts of stratagems to obtain a shot; but some of the smaller kinds, like the Bengal Florican, which are found in thick grass, lie close and are easy to shoot.

L. H. IRBY.

BUSTARDS, AFRICAN.—Bustards are to be found in many parts of the African continent, but, up to the present, the various species have only been determined with anything like exactness in the countries between the Cape and the Zambesi. Even here, it is probable that one or two new species may yet be established. In South Africa, where at least ten species are at present known, very excellent sport is to be enjoyed with the many bustards to be found almost everywhere throughout the country. The Paauw, or Kori Bustard (*Otis kori*), is the largest bustard in the world, and attains occasionally a weight of 40 lb. These noble game-birds are usually secured with the rifle. The Stanley Bustard (*O. caffra*), and Ludwig's Bustard (*O.*

ludwigi), rank next in size to the Paauw. Following these come the smaller Bustards, usually known to the colonists as "Koorhaans," many of which are extremely plentiful all over the country—especially upon the open plains—and afford capital sport for the shot gun. The Black Koorhaan (*O. afra*), Black and White Koorhaan (*O. afroides*), Vaal (grey) Koorhaan (*O. scolopacea*), the Bush Koorhaan (*O. ruficrista*), the beautiful Blue Koorhaan (*O. cœrulescens*), the Senegal Bustard (*O. senegalensis*), Rüppel's Bustard (*O. ruppeli*), and the Black-bellied Koorhaan (*O. melanogaster*), are all handsome and extremely interesting birds known to the South African sportsman. The great Kori Bustard (Paauw) is a magnificent table bird, and most of the others afford excellent eating as well as good sport. The gunner may identify these birds by reference to Layard and Sharpe's *Birds of South Africa*.

H. A. Bryden.

BUTTERFLY AND MOTH COLLECTING.—That butterfly and moth hunting is a sport, no one will deny who has ever chased a strong flying fritillary over rough country; or tried to snare over the treacle a restive rarity that refuses to become intoxicated. We therefore give a few practical hints for its successful pursuit.

Capture, Apparatus, &c.—To obtain the perfect insect in its wild state is the finest side of the sport, and the demand is not so much for elaborate apparatus as for activity and energy on the part of the pursuer. For the apparatus, a folding net, of the largest size possible, the ring fitting in a Y socket, is advised, and a broken golf-club makes an admirable stick. For killing purposes one may use a bottle or tin, the latter having the advantage that, if the lid is hinged, one hand can do the work of slipping in the insect. The poison may be *potassium cyanide* contained in a solid basis of plaster of Paris, or chloroform dropped on cotton-wool. Chloroform tends to stiffen the insects, but is quicker in action. The great objection is that one may at any moment find the stock exhausted, and the bottle empty, when far from all chance of obtaining the drug. In any case let the bottle or tin be filled with *very loosely* packed cotton-wool, to prevent insects rubbing on one another. Many collectors reject, for moths, anything but a pill-box, in which the captured insect can be taken home, and from which it can be killed at leisure. The great advantage is that many rare ova can be obtained from the females in this way. On the other hand, an excited rarity may batter itself on the way home, and one's pockets become crowded on a successful night. When in pursuit, mark the point of settling, and come up against the sun, so that no shadow may fall and startle the quarry. Almost all butterflies rise *perpendicularly*; therefore, get the net well above them.

Localities.—For *butterflies*, the best possible place is a rough open common near a wood, and, if possible, surrounded by woods. These should be worked thoroughly as should the ridings of the woods themselves. For those who can spare the time. a week or more in the **New Forest** is bound to yield much sport in all the entomological branches. Clover fields should be watched, and the hedges around them carefully beaten, for many moths lie there during the daytime. Disused quarries and railway cuttings are also found attractive.

The *Hawk Moths* are generally bred, but they may be caught with net and light about two hours after dusk, as they come to feed on such flowering shrubs as rhododendron, ivy, &c. A sharp look-out should be kept, during the months in which they come from their pupæ, upon fences, tree-trunks, &c., near their favourite food-plant. In the daytime, once seen, they are secured without difficulty. *Geometers* may be obtained in the daytime by beating hedges and skirts of woods, or by walking over rough ground. It is advisable to try to catch them on the wing as they rise, for, when they get to cover, they are extremely hard to find. They start of their own accord to fly by hedgerows, in gardens, and in the ridings of woods just after sunset, when for an hour and a half the net may be used with success. The usual method for the capture of *Noctuæ* is *Treacling*.

Time.—Moths may be captured all through the year, some few appearing only in the winter, but the season for butterflies rarely lasts for longer than from the middle or end of April to the end or middle of September. The best time of day is from about nine till eleven, and from one till three. At midsummer, a hunt before breakfast is sometimes well rewarded by a large capture of some of the rarer flies.

Treacling or Sugaring.—This is by far the most productive method of getting at least two-thirds of the British species, and has all the charm of uncertainty. The longer one collects, the more doubtful one becomes as to what really will bring success, and every moth-hunter has his different infallible tips. Of one thing, all have been convinced by experience that to take a layman out for his first experience of the excitement is to ensure a blank night. Some general rules may, however, be given, with an average probability of their turning out correct. As to the material, cane-sugar treacle is better generally than beet, and, personally, I have found the old black treacle, mixed with stale beer and a little rum, the most attractive; but other men with much wider experience have told me that golden syrup and methylated spirits is just as good, and they are certainly easier to procure in country places. One keen collector assured me that an absolutely infallible method was to take in the mouth a spoonful of the mixture, and to spray it on to leaves, &c., mingled with saliva! Not only did he recommend it, but he adopted it, and successfully, but his was a height of devotion to which few can reach. Generally speaking, the best pitches are the sidings of big woods, or trees standing outside the woods, but at the seaside one must, of course, be content with grass heads, posts, tufts of ragwort, low bushes, and anything. If possible, select a circuit of about a mile in a wood, choosing trees with a rough bark. It is an advantage to have the bottom of the trunk clear, in order to see those whose weaker heads took them under the table at an early stage. Ivy on the trunk, or a bush waving in front of it, is usually bad. As to *time*, the usual mistake is to put the treacle on too late. It should be on by sunset, and the moths will be on the first tree very often by the time one has completed the round. In summer, on a good night, they may continue to come in flights till two in the morning, but in autumn even stragglers are rare after eight. Treacle is rarely of any great use till April, but from then till November any night may give a prize—or a blank. Sometimes, during a drought, when there is much honeydew on the leaves, I have drawn blanks for a fortnight. As to weather, a cold east wind and a mist are fatal to success, but I have taken moths in April when it was freezing, and a pouring rain seems often to attract the whole population of the woods to the feast. I have seen moths on the trees, with toads and mice and bats taking their toll, and hawks sometimes come for the mice. The great advantage of the method is that the specimens can be secured undamaged, or alive if a pill-box be used.

Light.—Light has a curious and unexplained fascination for many species, and can be tried anywhere. Even in towns the street lamps will frequently give good results, and a poaching flavour is sometimes given to the expedition by the protests of policemen, and of the gas company's employees, a less easily propitiated race. It must be admitted that the gas mantles are liable to suffer damage. The best of the sport, however, is to be obtained in the fens. Choose the wettest spot that will bear the weight, fix a strong light on a pole thrust into the marsh; set a lamp of the ordinary stable lantern type on the ground, if possible in a clearing close to the edge of a reed bed, and, with any luck on a warm damp night, the collector will be mobbed by insects, from mosquitoes to *Hydrilla palustris*. A light moth trap, easily constructed at home on the eel-pot principle, gives more entertainment, and will go on working while the man with the net takes a desired rest. In summer, it is quite worth while staying at the lights till dawn, for the various species have their own hours of flight. The common Tiger Moth, for instance, is, of course, no rarity, but the sudden arrival at midnight of about a dozen in a state of wild excitement is a sight worth seeing.

Breeding provides the finest specimens and gives most scope for experimental work. Larva-cages can be bought, but are easily made, the essential point being to keep them clean. For fairly common larvæ, the escape of some of which is not important, there is nothing better than a grocer's orange box three-quarters filled with mould and carefully planted beforehand with suitable food-stuff. The top may be covered with mill-silk or perforated zinc. Another excellent method is to put larvæ on a suitable tree, and to tie a bag of muslin completely round the twig, shifting them when they have eaten off the leaves.

Pupa Digging may be carried on throughout winter and spring, but it is not wise to expect very abundant results. The best spots are around the trunks of big trees which stand at the edges of a wood, and, like the study of ancient Greek inscriptions, it is at least pleasant exercise on a fine day.

Setting.—First, and most important from the start, are **entomological** pins (*No.* 9 is a very handy size for most purposes). A badly-set insect may be relaxed afterwards, but a bad pin remains an eyesore, and its removal is a very delicate operation. It may happen that in the first year of collecting the best variety or the greatest rarity in the collection falls to the net, and is eternally disfigured. The needles used for extending the wings should be fine, but strong, and they will be found very handy if the head be thrust well up into the centre of a stout wooden match.

Of **Setting** there are many methods, the commonest being with strips of thin transparent paper passed over the wings and pinned down beyond them. Another, which can be strongly recommended, is to use only short setting boards, with room for one, or at most two insects. Instead of straps, soft, and fairly fine wool is passed lightly over the wings. One turn should first be taken over the wings close to the body, so as to bring them flat upon the setting boards for the needles to adjust them. Then wind *lightly* round the board as many turns of the wool as seem necessary to keep the wings absolutely steady. It should be mentioned that this plan is not found to work so well with the micros, for whose setting microscopic slides are sometimes used with success. The chief cause of bad setting is the taking of the insects from the boards before they are *absolutely dry*. Five weeks is by no means too long to leave them. A relaxing-box can easily be made by affixing sheets of cork to the bottom of any air-tight box. If these be damped and the insect pinned to them, it will be ready for re-setting in two days.

Preservation and Exhibition.—Albo-carbon, or its refined form, naphthaline, will preserve insects from mites, and should be kept in every drawer or box in which they are. Light must be jealously excluded.

When a collection is begun, a careful note should be made of the species likely to be found, and the available space accurately measured. A "Watkins and Doncaster" label list should be purchased and a proportionate space left with a label for each probable insect in case of capture. It is advisable to leave a considerable interval between each group, in order that an unexpected success may not involve the re-arrangement of the whole.

A good cabinet is almost the only part of his equipment for which the collector is necessarily dependent on others, but it is great unwisdom to attempt the saving of a few shillings in this department. The usual price for the best quality is 15*s.* each drawer, measuring 16½ by 19½ inches, and they can be obtained from any entomological firm.

C. S. COLMAN.

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CAMANACHD, or **SHINTY**.—This is undoubtedly one of the oldest games still played in the British Isles, although if the dictum of antiquaries of sport that games played with the ball alone are older than those played with ball and stick is to be credited, the Cornish game of hurling can boast a greater antiquity. There were, until the middle of last century, many points in common between the two games, and it is probable that they were originally one, and that the stick is a later introduction, linking the purer Celtic form as it still obtains in Cornwall with the Irish variation known as Hurley or *Caman*. James Logan, in Volume II. of his *Clans of the Scottish Highlands*, published by Ackermann in 1847, writes, under "Na Grantaich—the Grants of Glenmoriston":—

"The game of Camanachd, or Shinnie as it is named in the low country, . . . is very popular among the Highlanders: two opposing parties endeavour by means of the camac or club to drive the ball to a certain spot on either side, and the distance is sometimes so great that a whole day's exertion is required to play out the game. A vigorous runner, it is obvious, has a great advantage; but agility is not the only requisite; great skill in preventing the ball being driven to the desired goal is necessary, and many awkward blows and falls take place during the contest. Different parishes frequently turn out to try their abilities at this exciting game, and no better exercise could be enjoyed in a winter day. When there is a numerous meeting, the field has much the appearance of a battle-scene; there are banners flying, bag-pipes pealing, and a keen *mêlée* around the ball. Young and old, rich and poor, join in this athletic sport, and though it is usually engaged in *con amore*, prizes are frequently contended for."

Camanachd has changed a little since those days, in accordance with the inevitable process of development that occurs when a spontaneous athletic exercise becomes amenable to the tendency towards organised effort. To-day it differs as much from English Hockey (which is derived from Shinty), on the one hand, as it does from Irish Hurley on the other, though there remains a family likeness between the three.

The game—the national one of Highland Scotland—is now under the auspices of the Camanachd Association, the head of which is Lord Lovat, supported by many other Highland chiefs and chieftains, prominent among whom are Mackintosh of Mackintosh and Cluny Macpherson of Cluny, himself an enthusiastic Camanachd player. To the Association most of the better-known clubs are affiliated, including among others those so well known as the Beauly, Brae-Lochaber, Cowal, Furnace, Grantown, Glasgow Skye, Gleann Mor, Inverness, Invereshie, Kingussie, Kyles of Bute, Laggan, Newtonmore, Oban, Skye, and the London Camanachd Clubs. A cup is played for annually, the Clubs constituting the Association being divided into northern, central, western, and southern districts for the purposes of the cup tie. The secretary of the Association is Mr. W. Macdonald Fraser, Inverness. The winners since the institution of the cup are: Season 1895—6, Kingussie; 1896—7 and 1897—8, Beauly; 1898—9, Ballachulish; 1899—1900, Kingussie; 1900—1, Ballachulish; 1901—2 and 1902—3, Kingussie; 1903—4, 1904—5, 1905—6, Kyles of Bute; 1906—7, 1907—8, 1908—9, 1909—10, Newtonmore.

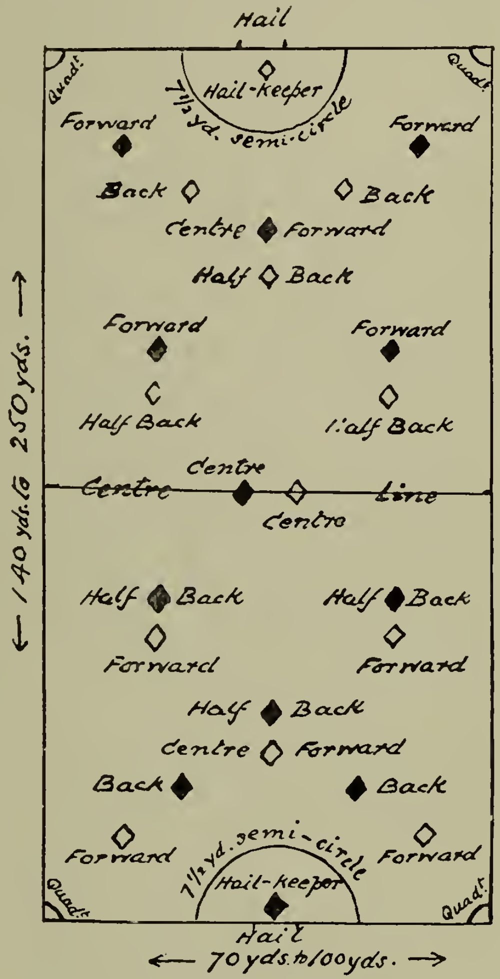
Implements of the game:—

The Ball is made of a cork core bound with worsted thread and covered with leather sewn with coarse seams outside that often contribute a great deal of spin to the ball. It is small, about 2 ins. in diameter, and must not be more than from 7½ to 8 ins. in circumference, nor weigh less than 3 nor more than 4 oz.

The Caman, or Club, was formerly any rough stick with a curved head, but now regular Camanchd clubs are manufactured having triangular heads, the sole forming one side of the triangle, and the other faces sloping to a ridge.

The Hails are the goals in hockey and other games, and consist of two posts fixed in the ground at a distance of 12 ft. from each other, and connected by a cross-bar at a height of 10 ft. from the ground. Nets are attached to the cross-bar and uprights, and fixed square with the hails at a distance of not less than 4 ft. 6 ins. behind the hail-line.

The Field of Play may not be more than 250 yards long by 100 yards wide, nor less than 140 yards long by 70 yards wide. A 7½-yard semi-circle is drawn round each hail, and in all four corners of the ground 2-foot quadrants are marked. A line is also drawn across the centre of the field.



A Plan of the Field of Play.

The Time of Play is an hour and a half, with a five-minute interval at half-time.

The Number of Players on each side is twelve, and each side appoints two hail judges and two linesmen, with one referee chosen by both clubs. A list of approved referees is published annually by the Camanachd Association.

A glance at the accompanying plan will show the positions of the teams at the commencement of play. The centres stand facing each other on the centre line with their clubs crossed in the air. The referee, standing in mid-field, throws the ball straight in the air to a height of not less than 12 feet between the two opposing centres. The ball is played in the air as well as on the ground, the object being to place it between the hail-posts of the opposite side. In the original game, as is still the case in Cornish hurling, the object was to carry the ball to one's own goal. Nothing but hails count; there are no "points" as in Irish hurley. No players except the hail-keepers are allowed to touch the ball with the hands, though in a scrimmage where clubs are interlocked the feet may be used to disengage the ball. If a hail-keeper catches the ball (as he may to save his goal), he must drop it at once. No metal is allowed on the caman, nor any spikes in the players' shoes. When the ball goes beyond the side lines it is out of play, and must be taken in 16 yards and thrown up between two players by the referee, as at the commencement of the game; if beyond the back-line, corner hits from the 2-yard quadrants are allowed. And there are various other penalties. The nearest approach to an "off-side" rule is that which provides that no opponent shall be allowed to stand within the 7½-yard semi-circle of the opposite hail unless the ball be in play in front of him.

The caman is gripped with the left hand above the right, held in a horizontal position across the body, prepared either to meet the ball in the air, or to pick it off the ground with a short, quick swing. Both hands must be employed in hitting. Either hand hitting is essential to really effective play. The flat part—the sole—of the bass, as the hitting part of the club is called, is used to stop long dropping shots, and the caman is so constructed as to be used both for right- and left-handed strokes. It is part of the game to "tackle" an opponent in the act of making a stroke by hooking his club from behind as he raises it to strike. The winning game is that which keeps the ball in constant motion, travelling over the field of play from man to man; though dribbling is sometimes a useful accomplishment.

It will be seen from this brief outline that Camanachd is a fine free game, unhampered by the restrictions that have served to popularise its degenerate offspring hockey in the south, but for which the hardy Highlander has nothing but contempt.

In addition it is the only outdoor game to which music is a necessary accompaniment, the skirl of the bag-pipes being an inseparable adjunct of the play, and the teams invariably marching to and from the field headed by their official pipers, who also celebrate the scoring of hails and the triumph of their sides with a "screigh" on the pipes.

L. C. R. Cameron.

CAMPING OUT.—AFRICA, SOUTH.—To ensure the success and enjoyability of a sporting trip, it is essential that the creature comforts, as regards both food and lodging, should be carefully attended to; and a few words on the subject may be useful to those who have not had experience of the somewhat difficult task of remembering beforehand and providing every requisite for an expedition into uninhabited country far away from shops or stores.

Wagon Outfit.—If it is not proposed to enter the Tse-tse fly country, the best and most comfortable mode of locomotion in South Africa is by Cape wagon. A good full tent wagon costs from £80 to £100, and in this there is ample room for two comfortable *kartel* beds, and the stores, rifles, and ammunition requisite for two hunters. Such a wagon requires twelve trek oxen or fourteen donkeys. The writer prefers the latter, donkeys being more tractable and very much hardier than oxen. Trek oxen cost about £9 each; donkeys, about £5. A few extra oxen or donkeys should be provided to be used when any of those in the regular teams are sick. Although the cost of each wagon and team entails a serious outlay (£200 at least), it is cheaper in the end to buy outright than to hire, for if the wagon is a good one and stands the test of, say, six months' work, the price originally paid ought to be obtained for it at the end of the trip.

It is best to regard the price paid for the *teams* as money sunk, for the chances are that, through sickness and accident, very few of the animals will be worth much when the journey is over. The best wagons are those made in Durban and Grahamstown. Second-hand ones are generally obtainable in Mafeking and Johannesburg, the former of which towns is the most convenient starting-point for the Kalahari and Chobè countries; the latter for a point of departure for the bush veldt of the North-east Transvaal. A piece of canvas, ten feet by fifteen feet, will be found most useful to form a shelter from the sun, either thrown over the roofs of two wagons drawn up abreast, and five or six feet apart, or rigged as a lean-to tent against the side of one wagon.

Each wagon requires one driver at about

£3 per month, and one "forelouper," or leader, at about £1 per month, in addition to rations. Cape boys and half-breeds make the best drivers. A boy is required to look after the horses of each member of the party, and to each wagon there should be attached a couple of boys to do odd jobs, such as collecting wood and bringing water to the camp. A cook is, of course, indispensable. When the game country is reached any quantity of natives can be engaged at 10*s.* a month and as much meat as they can eat (that is what they really come for), to find and track game. Each member of the party should be provided with two horses, which can be obtained at from £20 to £25 apiece. "Salted" horses (*i.e.,* horses which have taken and recovered from horse-sickness) cost from £60 to £100.

A couple of pointers should be taken for partridge and koorhaan shooting, and a pack of mongrels (the more numerous the better) for lions, leopards, &c. These mongrels can be bought at the Johannesburg dog pound at a few shillings each.

Carriers.—The following remarks on provisions and camp furniture in the Tsetse fly country apply equally to the outfit for a wagon expedition.

If the scene of the hunting trip lies within the fly belt, or in British or German East Africa, wagons, oxen, horses, and dogs must be dispensed with. The party have to travel on foot, all stores, tents, &c., being carried by native carriers. If a large number of these is required, some difficulty and trouble will be experienced in obtaining them. Zanzibari or Inhambane boys are the best carriers, the latter for choice. It is advisable to write out beforehand and get someone to engage the required number of carriers and ship them to the port from which it is proposed to start. The recognised weight of a man's load is 60 lb., but they will carry 70 lb. or more. From 20s. to 25*s.* per month and two pounds of rice per day is the wage of a Coast Kaffir carrier.

A CAMP ON FLINT ISLAND.

Camp Furniture.—In any case, whether the start be made from Johannesburg, Mafeking, or Kimberley by wagon, or from Beira, Chindè, Mombasa, or Lamoo with native carriers, it is best and cheapest to bring out from England *everything* necessary for the comfort and support of the European members of the expedition. The best tents (these are not required on a wagon trip) are the Weissman tents. One of these, seven feet six inches by six feet, made of stout Willesden canvas with double roof and canvas floor-cloth, costs £9, weighs 100 lb., and affords comfortable accommodation for two Europeans.

Messrs. Edgington provide comfortable camp-bedsteads fitted with hair mattresses and mosquito curtains, which pack into a very small compass in waterproof covers, at a cost of £3 10*s*.

A strong folding-table should be taken, and, *most important*, each member of the party should have a folding deck-chair with detachable canvas seat. It is when the long day's march or hunt is over, and the party sit around the camp fire, that the man with the best chair experiences the greatest amount of comfort. For him who has neglected to provide himself with this hunter's luxury, there are only the alternatives of going to bed away from the jovial chat around the fire, or of laying his aching bones upon the ground, with a very good chance of a sting from one of the numerous scorpions which have had notice to quit from the burning logs.

Stores.—The writer strongly recommends the Army and Navy Stores as a place where everything may be obtained.

Write out a list of what is required, and ask the manager of the Export Department to appoint a clerk to go through it with you. Have the stores packed in half-inch deal boxes with lock, iron hinges, and rope handle at each end, each to weigh 60 to 70 lb. when filled. Each box should be numbered in large figures, and packed with a small amount of the several articles required for daily use, so as to necessitate the opening of as few boxes as possible each day. A list should be carried showing the contents of each box. By this means any article required can be found immediately.

No vegetables being obtainable in the wilds, it is essential to take plenty of desiccated vegetables, dried fruits, figs, and raisins. Lard for cooking is most important, the game in some districts being devoid of fat. Danish butter in tins (the smaller the better) keeps well, and is a great luxury. Cheese should be encased in bladders in order to keep well. Bacon should be packed in salt. Tea, coffee, Swiss milk (unsweetened), in tins; jams, golden syrup, soap, spices, salt, candles, and lime-juice should be included, and a bag of oatmeal and another of lentil beans will be found useful. Macaroni, arrowroot, and essence of beef should be taken as food for fever patients. Flour should be packed in 14-lb. tins, and care should be taken that the supply of baking powder is ample. Saccharine should be taken in preference to sugar. The best and safest mode of carrying whisky or other spirits is in stoneware jars encased in wickerwork, with a metal cover over the bung, which locks with a padlock.

In addition to plates, cups, knives, forks, saucepans, &c., a mincing machine should be provided, also a large iron three-legged pot with lid, for baking bread.

Messrs. Silver and Co. supply very good folding lanterns with talc sides. Two one-gallon filters, axes, saws, hammers, gimlets, knife-sharpeners, and files should be included. A few pounds of six-inch French nails will be found useful for pegging out skins. They do not make such unsightly holes as wooden pegs do.

Skin Preserving.—Napthaline tablets prevent the ravages of insects among skins, and for curing the latter nothing is so good as salt and alum, mixed in the proportion of two parts of salt to one part of alum. This preparation should be well rubbed on to the raw side of the skin immediately it is stripped from the animal; the skin should then be folded into as small a compass as possible, and left *for not longer than* six hours in that state. When opened out it will be found that the skin is thoroughly cured and ready for pegging. On no account let it be exposed to the sun when pegged out. Arsenical soap and all other taxidermical preparations are costly and dangerous, and not nearly so effective as salt and alum. The white ash of the camp fire forms an effective substitute for salt and alum when the latter are unobtainable.

Medicine.—A medicine chest is, of course, an important part of the outfit. Messrs. Burroughs Wellcome and Co. know all about the medicines requisite for Africa, and they supply all drugs in tabloid form. These keep better and are more portable than powders or liquids. Quinine, calomel, and opium are the most important drugs, to which should be added iodoform, carbolic acid, carbolic oil, strong ammonia, sticking plaster, lint, and a clinical thermometer.

A. M. NAYLOR.

AMERICA, NORTH.—To the ordinary mortal, camping out means roughing it, but to an old campaigner it signifies, if not absolute comfort, something akin to it, and this at no extra cost or additional paraphernalia; in fact comfort is as easily obtained as the reverse, if only you know how to set to work.

The most useful pattern of tent for North America is the A shape, which is obtainable in most American towns, and costs but a few dollars. The advantage of this tent is that nothing but the bare canvas need be carried, as the ridge pole and two supports can be cut on every suitable camping ground throughout the Rocky Mountains.

For winter work, the Indian Tepee cannot be improved upon: it is cone-shaped, supported by thirteen poles, and permits of a good fire inside, the smoke escaping through the open top. This tent can only be procured from Indians, and would be useless in a district destitute of small trees, unless inhabited by those tribes of Indians who always leave their Tepee poles standing when they move camp.

[*Photo. kindly lent by H. Hesketh Prichard.*

Camping Out in Labrador.

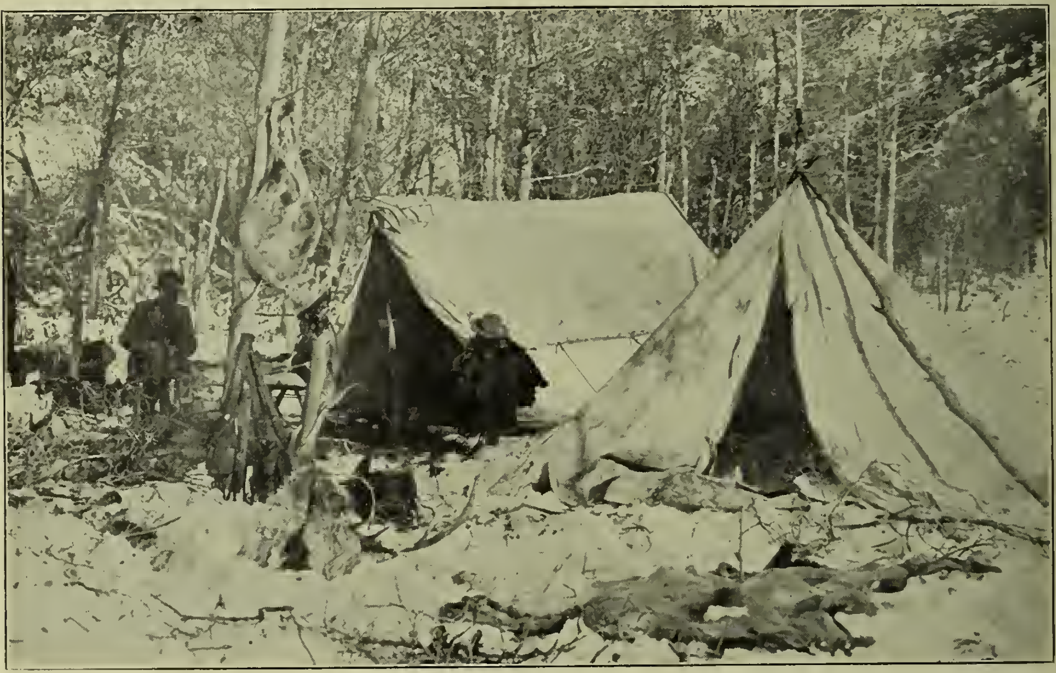
Another useful form of tent is the Lean-to, very serviceable in the mountains when a man may have to carry his whole outfit on his back; it simply consists of a sheet of canvas 8 ft. by 5 ft., which is fixed to windward in the same fashion as the A tent, and represents when erected half the root of this tent. It serves well as a shelter from wind, snow, or rain.

Tents should not be taken out to America, but procured on the spot. What should be carried in the way of cooking utensils and luxuries entirely depends upon the mode of conveyance, and that is regulated by the nature of the country. It is sometimes possible to manœuvre a wagon, otherwise the ordinary means is by pack horses, canoes, or pack Indians. In any case, however, some experienced person will be required to superintend the arrangements, and the only serviceable articles which cannot be procured on the spot are a good canteen and air bed. Anything else brought from England will only prove an additional expense and encumbrance.

Camping in the States and Canada is simpler work than in British Columbia, where the further we penetrate north, the greater become the difficulties. There is a marked difference between riding with a pack train of horses along a good trail in the beautifully timbered, park-like mountains of Wyoming, and plodding on foot behind a party of Indians through the almost impassable forests of Northern British Columbia. But the requirements for a good camping ground are the same, and consist of three essentials: namely, water, dry firewood, and sufficient level ground to pitch a tent on. No one who has not tried it could imagine the difficulty of remaining all night in a tent pitched on an incline. Fortunately in America, except upon the Prairies, there is rarely any difficulty about wood and water. The former is an important object, and necessitates a good axe-man, who knows how to lay his logs Kentucky fashion in order that the frying-pan bread may be properly baked beneath. Where wood abounds there is no occasion to economise it, and, therefore, when a dead tree is felled, it is cut into eight-feet lengths, which are laid upon two short cross-pieces for dogs. Then, if a birch is handy, some bark is stripped off and placed beneath. This burns furiously, and the whole is soon ablaze and in condition to cook the fresh trout just caught, and the venison which will have been killed *en route*.

Camp life is exactly what you choose to make it, and the fussy man and grumbler are an abomination. It is a curious fact that, charming though it be, camp life brings out all the worst traits in nature, and fortunate is the party which can produce four friends who have camped together for a week without at least a coolness between some of them. "Be certain of your man, or woman, before asking either to camp out," is excellent advice, but very difficult to follow. Persons camp out for one of three reasons—Big-game shooting, fishing, or an idle life of pleasure. In the last case it may be presumed that the camp is supplied with servants and every possible luxury, though what people would find to amuse them after a couple of days of this life it is hard to say.

The fisherman may furnish his camp luxuriously, for when once on lake or river bank it becomes a permanency; it can usually be accommodated with anything desirable from no great distance. A very delightful time can be spent thus, but America's greatest curse, the mosquito, often renders an otherwise perfect summer unendurable. By selecting an open spot, however, in a breezy situation on the bank, and guarding it with mosquito-netting, no great discomfort from these pests need ensue.



[*Copyright by Underwood and Underwood.*

A NIGHT CAMP ON THE TRAIL IN MONTANA.

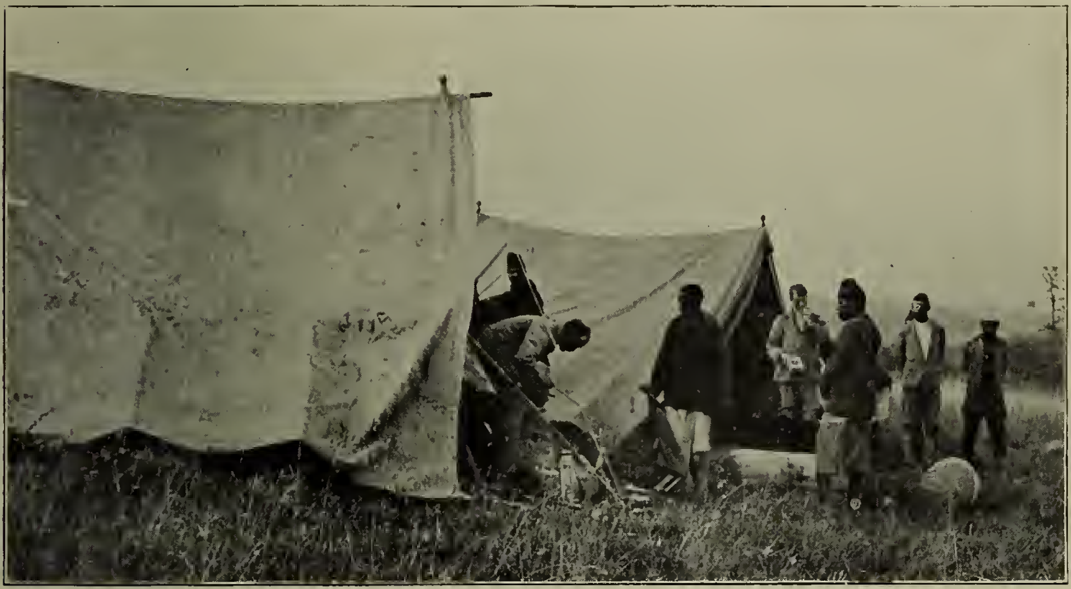
Camping after Big-game requires the judgment only obtained from experience. The all-important object is reduction in weight, which necessitates baggage being restricted to the absolute minimum. A horse carries on the flat a pack of 300 lb.; an Indian, 100 lb.; and a squaw twice as much; but for mountain climbing these weights are reduced. Pack-horses must be packed by an experienced hand intimate with the intricacies of the diamond hitch. A hunting outfit will be wanted as follows: Tent, blankets, frying-pan, canteen, three round pots fitting into one another, flour, baking-powder, sugar, bacon, tinned milk, salt, pepper, tea or coffee, and rice; soap, towels, dish-cloths, and also hobbles for the horses. As it is often impossible to camp high up a mountain, lightly equipped expeditions from the main camp must be undertaken. On these excursions, a hunter will carry his own pack of about 50 lb. weight, consisting of Lean-to, blankets, frying-pan, coffee-pot, round pot, flour, bacon, coffee, sugar, and salt.

Find a snug spot to camp in, and if the weather is fine and the thermometer above zero, the Lean-to can be dispensed with, a large fire supplying sufficient heat. A comfortable bed is made by plucking a quantity of tips from fir branches and laying them carefully one upon the other to a depth of several inches. This also forms a most satisfactory bed upon snow. If bare ground is slept upon, a spot should be selected with slight hollows to fit the hip and shoulder, for they add greatly to comfort, or such hollows can be scooped out for one's self. Late in the season there will be no water, and snow has to be melted in the round pot. To roast fish and grouse, clean and split them, then fix them on sticks, stuck into the ground close to the fire. They will be found delicious. Bread is baked in the frying-pan.

J. Turner Turner.

INDIA.—There is no difficulty in procuring tents in India, as they can be readily purchased or hired. For shooting purposes the less camp equipage that is taken the better. For a single sportsman a Cabul tent weighing 80 lb. and a Rowtie for the servants is sufficient. In the hot weather it is cooler to sleep in the open air, and even in the day-time it is pleasanter to have one's meals and to sit out under the shade of a tree, so that a tent is not much required for living in. It is, however, convenient for keeping things together, and is also useful in case there should be rain: heavy thunderstorms occasionally occur in the hot weather. A Cabul tent has a double roof and keeps rain out well. It is also a good protection from the sun in the heat of the day should the shade of the trees, under which a tent can almost always be pitched, not be sufficient. About half the space of such a tent is taken up by the bed, which is placed along one side. A piece of netting should be sewn along each wall of the tent so as to form three or four large pockets, which are very convenient for holding clothing, books, and other articles in constant use. Another tent, which gives more room and is light, is the Bechoba, a square tent with light bamboo framework and no pole. A small place outside the tent can be screened off for a bath with boughs or mats. In the cold weather, the nights are very chilly and there is heavy dew, and it is necessary then to sleep inside the tent.

A good bed is of great importance when out shooting, as nothing rests one more. Folding-up camp beds, as sold in shops, are all uncomfortable. The best plan is to have a strong bedstead made, 7 feet by 4 feet,



Prince Arthur of Connaught's Camp in British East Africa.

with cotton webbing, costing about ten rupees. No mattress is required; a *resai,* a kind of quilt stuffed with cotton (cost five rupees), answers that purpose. Such a bedstead is easily carried on a cart if placed on the top of the baggage, and the *resai* is rolled up with the rugs. If a folding bed is required, a good one is made with a stout piece of canvas. Each side is sewn round a bamboo, and the ends of the bamboos project and fit into stout wooden legs. Another bamboo at each end of the bed fits into these wooden legs, keeping them apart to the full width necessary to stretch the canvas tight. The two ends of the canvas are furnished with straps and buckles which pass round the end bamboos, and pull it tight in that direction. The objection to this kind of bed is that the canvas gets stretched with the weight upon it and bags down. It is convenient to carry, for the bamboos can be slipped out of the legs when the straps are undone, and the legs are rolled up inside the canvas. An ulster should always be taken. In the cold weather, at night, and in the early morning, it is most comfortable in camp. Even in the hot weather, the air is frequently chilly if there is rain. In the cold weather, plenty of warm coverings for the bed are necessary, and in the hot weather a good blanket or rug is often wanted in the early morning before sunrise. Carriage is easily procured; the most usual is the bullock cart. A sufficient number of carts should be hired for the trip at so much a day (about 12 annas =1*s.* each). It is a little more expensive, but much more comfortable than hiring locally for each move. In some places camels are used for transport; in others everything has to be carried on men's heads. For supplies, fowls and milk can generally be obtained, but it is a good plan to buy two or three dozen live fowls and take them with you. Sheep or goats can also be got, but the sportsman will find that the less he draws on local supplies the more popular he will be. In any case he should make a point of paying in person a full price for everything got from the villagers, as native servants are apt to give less than what is due, if payment is left to them. When moving camp, the Patel or headman of the village should be seen and asked whether everyone is satisfied. A small tip to the village officials and to such of the villagers as have attended to the camp requirements, should not be neglected, for then the visit of the Sahib and his retinue will be a subject of congratulation. A butler, cook, and a third servant to make himself generally useful, is sufficient for the ordinary sportsman. A good water-filter is essential. At least three *chaguls* (as the leather water-bags are called) are required for each sportsman to have with him when shooting. Two should be taken out on a day's shooting in hot weather, and one in cold, the remainder being left in camp so as to have a supply of filtered cold water in the evening. Water in leather bags becomes quite cold. In order to sweeten new chaguls and remove all taste of leather, fill them with buttermilk, put in a handful of turmeric, and allow them to stand for two days.

When out shooting in camp for more than a week or so, it is advisable to take a Bania or native grain dealer with you, who will carry food for your men and feed them at 2 annas (about 2*d.*) per head per day at your expense. Everything that is required in the way of tinned meats, stores, liquor, cartridges, ammunition, and supplies generally can be bought in any of the Presidency towns as well as in England. If horses are used, a supply of grain, which is a substitute for oats in India, must be taken.

J. D. INVERARITY.

Bibliography.—*The Camper's Handbook,* T. H. Holding (Simpkin), 1908; *The Book of Camping and Woodcraft,* H. Kephart (Grant Richards), 1909.

CANOES AND CANOEING—Cruise the world around, and there is not a place or port you can visit without encountering some form or type of canoe. Go back in history beyond the memory or records of man, and you will still find canoes. The early naval engagements, whether by State against State, or by individuals or clans or syndicates against any body or any State they could come across, were fought in canoes, or in craft of canoe type; indeed, we can hasten down to modern, up-to-date war, and find that one of the most destructive craft afloat at the present day is distinctly of canoe form—the torpedo boat.

Definition of Canoe.—There are those who will define a canoe as a craft that is propelled by paddles wielded by man or men; but there are many types of canoes, belonging to countries thousands of miles apart, in which the paddle, except for steering, is an unknown implement. In these craft, sail is the furnisher of motive power by agency of the wind, or *vice versa.* Then, for civilised modern times, why not steam or electric propulsion?

If the craft is in type, form, and utility a canoe, and is propelled by a man wielding a paddle, she does not change her nature when the man ceases to paddle and hoists a sail, or when he, by suitable machinery, waggles a differently formed paddle, such as a screw propeller. I think there may legitimately be paddling-canoes, sailing-canoes, and motor-canoes; and, further, that the mode of propulsion should not determine the classification of a craft; but that model and capability to do work commonly assigned to canoes and canoeing is the true guide. No matter where you make your choice of investigation on the millions of miles of sea shore of this world, you will find the "canoe" of that place is formed "sharp at each end"; she is a light draught craft, capable of being navigated in very shoal and also in very rough water; of as easy propulsion astern as in going ahead; except in a few rare cases she is always transportable by manual power from water to water overland; she is long, narrow, and of light construction.

As to the canoes of savage peoples, any well fitted museum will furnish quite a bewildering assortment of models thereof, if historical research be the aim. We want, however, to get to canoeing as a sport at the present day; and in order somewhat to classify the type of craft which can legitimately claim to be a canoe, we may as well suggest "what is not a canoe."

You may have a canoe, and they exist in many parts of the world, of one hundred feet or more in length; you may have a canoe which carries fifty men; or you may have a canoe which will sail under five hundred square feet of sail, or down to fifty feet on small craft. But each of such craft can be paddled by her crew at or over her sides, by hand-worked paddles, without fixed boat-fulcrum; or she can be sailed under easily removable sails and spars; and she will be able to navigate into waters barely ankle deep, and she will be sharp at each end.

Therefore it is obvious that a small yacht, even though her hull be long and shallow and pointed at each end, if she be of deep fixed draught, with heavy spars and gear not immediately removable, and herself so weighted as to be too heavy for manual transportation, cannot rightly claim to be a canoe.

History of Canoeing.—Coming now to modern times, we may take it as settled that the sport of canoeing—that is, river canoeing under paddle, and travelling abroad chiefly under paddle, but with a small sail for use in fair winds, was brought in and popularised by John MacGregor in his *Rob Roy* cruises and books thereon between 1866 and 1869. And canoe sailing in small canoes was similarly introduced by the writer's voyages in the *Nautilus* in Sweden and the Baltic during 1870 and 1871. Here it may be said that possibly there were other canoes more or less rigged; but with the exception of Mr. Tredwen's *Pearl*, which came into public notice immediately afterwards, there were none in evidence.

Clubs were constituted and held regattas, and the effect of the racing competition, which was extremely keen, soon showed itself in the improvement of model, rig, and fitment, which progressed by leaps and bounds and brought the sailing canoe up to such perfection that, though comparatively a tiny craft, there were several sailing clubs which then barred canoes from competing in their races, because they were too successful.

Canoeing, both paddling, sailing, and cruising, quickly became an acknowledged branch of sport, and it rapidly spread to the Continent and to America; and one soon heard of Englishmen, stationed away in far distant parts of the world, building and using canoes. *Canoe Travelling*, a book published by the writer of this article in 1871, was the first book on canoe design, rigging, and fitting, and it gave drawings thereon; and thereby the sailing canoe of those early days was known as of *Nautilus* type. The *Pearl* above mentioned, which came out shortly afterwards, was of somewhat different lines, or shape, but only so in detail, and of the *Nautilus* and *Pearl* new specimens of improved model and rig were steadily produced year by year, and led the fashion in building. They continued so to do, and to race, up to 1890, and since that year up to the present *Nautilus* designs have been from time to time published. Of course there are many men who have produced designs and built canoes which, in their opinion, are of original design; but distinct type they can hardly fairly claim, and it matters not here, nor indeed at all, to seek in them family likeness to *Pearl* or *Nautilus*. I will merely, in regard to the history of the sport, say that when these two sailing canoes were produced there were no existing sailing canoes of any practically valuable nature to copy, and the only book dealing with such craft at that time was *Canoe Travelling*; but since then canoeing, in technical articles and books, has been constantly before the public here and in America. The well-known technical book, *Yacht and Boat Sailing* (Horace Cox), has, in each of its eight editions, contained a complete up-to-date "Canoeing Section," with designs, and drawings, and articles from the pens of "Nautilus," "Pearl," "Cassey," and many other canoe men. (The 6th and 7th editions give the fullest amount of designs and details, the advent of small yachts' designs having rather crowded the canoeing in the eighth edition.)

At all times in the life of the sport of canoeing there has been a marked line between sailing and paddling; there have always been in each of the clubs, both in England and in America and Canada, paddling men who never sailed a canoe, and men who owned canoes built entirely for pleasure paddling, or for racing only. In like manner, there has always been a division of men in each club who never used a paddle in their canoes except when a dead calm overtook them out sailing. But naturally also there have been a few instances of canoeists who have raced successfully both in the sailing classes and in paddling; and on the two £50 challenge cups of the Royal Canoe Club, the sailing and the paddling, may be found three or four double championship holders in the twenty years' existence of the cups.

Paddling Canoes.—The racing paddling canoe is very like the hull of the sculling wager-boat, but without the rowing fittings and seat; the racer is built of two streaks only, one on each side, of cedar less than one-eighth of an inch thick. As to size, they of course vary according to the size and weight of the men they are built to carry, but probably an average size would be 20 ft. long by 22 in. wide at top-side. They are decked fore and aft, retaining a bulkheaded "well" or open section of about 4 ft. in length, guarded by a narrow side deck and shallow coaming. In this "well" the man sits on the floor, and has at his back a suitable back-board to press back upon, and an adjustable foot-board or stretcher forward. The paddles used in England are very short, 7 ft. 6 in. to 8 ft. long, with broad spoon blades; the stroke is made close along the side of the canoe, with the body kept sitting erect. In America, the racing paddlers sit on comparatively high seats, some kneel, some even stand up; they use very long paddles and usually have the blades set up at right angles to one another, so that the one passing through the air is doing so edgewise while the other is square in the water. Moreover, the American canoes used in paddling races are much larger, *i.e.*, wider and deeper, though shorter than the English "single-streak"; indeed, the single-streak could not be "sat" if a raised seat were used, and it is only by careful practice that one can sit her for effective work—that is, in the extreme models.

The open Canadian model, in which single blades, or half-paddles, are used, is decidedly the favourite river canoe of the present day. Though a considerable number of *Rob Roy* type, or quasi-*Rob Roys*, may be seen on any of our large rivers, they are dropping out. For real travelling, the Canadian type, with its open body, lends itself so easily to ample stowage of camp gear, to quick stowage or discharge, and to easy transportation, that it is only the inexperienced who will, for river or small lake travelling, take the small "decked" canoe of *Rob Roy* type or the later modifications thereof.

Where, however, the tour is to extend to crossing large lakes or to cover some open estuary work, the decked canoe is almost a necessity; but then it is advisable, for such work, to go to the sailing canoe type for safety and comfort. I have had experience on large lakes, in a small decked canoe of semi-*Rob Roy* type, of being wind-bound on an island with food supply growing short and seas running too heavy to allow even a hope of crossing to main land; luckily, the wind gave in before the man had to. A fine summer evening is apt to tempt one to make camp on an island, so as to be free from inquisitive visitors, both of man and of animal nature; but morning may break with a summer gale blowing, and then is the time to appreciate the value of every detail of the complete sailing cruising-canoe. In the first place, her reserve of stores will, or may be, ample, but even if the rough water has to be faced, she will do it, if properly handled, in anything less than a real hurricane.

With regard to travelling in canoes on inland waters, it is well to point out that such work is of two distinct kinds, and that to accomplish each in perfection needs a totally distinct canoe type for each. For the quick-running, shallow, rocky river, with vicious rapids and dangerous falls, with forest portages and the necessity of camping out each night, there can be no question that the open or partly decked Canadian type is the best. The *Rob Roy* type is well enough on easy rivers, canals, ditches, and such like; but in a really bad rapid, and for rough portaging, she is a poor craft. The camp kit, clothes and stores that can be stowed in canoes of the *Rob Roy* type are about fit for a doll, certainly not reasonable for a man, unless an hotel is more or less a certainty every night; even then, in addition to the time wasted in minute packing and unpacking, there is the frequent experience of getting all the cargo soaking wet, and stores spoiled after a wet passage through a rapid, or by the leakage common after a few days of bumping on rocky shallows.

In the Canadian type all the perishable stores, clothes, bed-clothes, charts, &c., can be stowed in waterproof "kit-bags," *i.e.*, long, cylindrical bags with an internally flounced mouth, which can be fastened so as to be quite watertight. The tent, preferably furled on or around its poles, so as to be ready for immediate setting up, can be stowed lengthwise in an open canoe, whereas it must be disjointed and packed away in parts in a decked canoe. The kit-bags, cooking gear, and other stores stow amidships; and the two men (preferably two) are stationed, one in the bow and the other in the stern quarters of the canoe. In this way, when she grounds on a shallow the crew jump out and guide her or partly lift her over; or in a few moments the cargo can be lifted right out and landed, and the canoe can be carried over any obstruction. Everything should be lashed in, so that in the event of a capsize nothing is likely to fall out. In this connection, a plan of mine, which will take a lot of beating, is—fit a removable 6 ft. canvas compartment to the middle third of the canoe. It is made thus: One sheet of fine, close-woven duck, either "in the piece" or built in cloths 6 ft. wide, is cut to a length sufficient to lie close across and around the inside and bottom of the canoe, and then across to meet in the centre at the level of the gunwale or top-sides. Two pieces of duck are cut to form bulkheads or ends, of the exact form and size of the transverse section of the canoe; the top of the after one is cut at about 1 ft. above the level of the gunwale height so as to leave this 1 ft. to fold in; the other forward bulkhead is preferably left at its top 6 ft. long, so as to act as flap or cover overalls in wet weather. The edges of the bulkheads, so far as they represent the cross-section of the canoe, are then closely and strongly sewn to the edges of the sheet which forms the bottom and sides and lids, and these edges should be neatly roped and have suitable beckets for lashing down to the bottom and sides of the canoe. When packed with all the bags of stores and gear, the two flap edges, having eyelet holes, can be laced or tied together, and the forward bulkhead flap part is then folded aft over all and forms a roof. The whole thing may be waterproofed with linseed oil, or the top flap only; in the former case this "bag-well" will be found very useful as a waterproof ground-sheet for sleeping on. Or, on a pinch, when caught out at night without the proper tent, the canoe can be bedded on shore beneath suitable tree branches, and the bag-well suspended therefrom and spread by a few bent sticks around its real bottom (now its roof). A very fair bedroom is made, and the front flap will just about cover the kit. If the canoe has a fair amount of end decking, say 2 ft. 9 in. or 3 ft. on a 16 ft. canoe, the open body of the canoe will be thus covered in, and be pretty nearly, if not quite, rainproof. Such quarters, of course, are rather cramped for two men, though ample for one; but it is far better to sleep dry in a semi-sitting posture than to have to drag through a wet night with no shelter.

Kit and Equipment.—The first point to which an experienced canoe-cruiser looks, after assuring himself of a suitable canoe and an expert companion, is a reliable night camp-kit. There is no such thing as a "standard camp-kit"; what is a perfect kit for one man may be the very reverse for another. One man will fiddle over an intensely wonderful mechanism for cooking—a spirit-stove surrounded by a swarm of little pots and instruments (of about half of which he will lose tally in a two weeks' trip) and take an hour morning and evening in packing and unpacking a sort of Chinese puzzle; while another man does the whole work of cooking over a fire of drift wood with a tin Billy-pot, a fry-pan, a tin mug and a tin dish. As to clothes, the experienced man will have nothing but flannel and wool. The only linen fabric in his outfit will be handkerchiefs and perhaps a white cap cover for hot, sunny days. The bedding may be summed up thus: two thick blankets, one to go folded as a mattress for warm nights, or both to be used on cold wet nights; one inflatable pillow covered with blanket bag (which can be taken off and dried at the camp fire). A suit of pyjamas of thick wool must be taken, and a pair of old fishing wading stockings, cut to knee-boot length, are very useful for early morning wet grass movements when packing and launching.

Matches should be kept in corked bottles, and tea, tobacco, sugar, salt, and many other stores which are liable to suffer from damp, should be kept in carefully fitted tins stowed in waterproof bags; especially biscuits, which are the most convenient bread stuff that can be carried. As to adjuncts to camping, those essential are an efficient lamp with store of wick and oil, a small axe, and several sailor's sheath-knives. A can of petroleum is not a bad thing in camp for quick fire-getting in wet weather, but it is a fearful nuisance in the canoe unless it is absolutely oil-tight in every way. If a gun is taken, it should be provided with a bag-cover like a sponge bag, absolutely watertight when its neck is tied tightly; and the cartridges can be carried tied in a sponge bag—indeed, sponge bags of mackintosh are extremely useful in many ways in canoeing, where rain and duckings are not unknown.

Canoe Sailing.—We will now turn to what is really the leading feature of present day canoeing as a sport—and that is, undoubtedly, canoe sailing. Canoe sailing, with one exception, which we will mention and then leave altogether out of consideration, is now clearly divided into two branches, namely, the sailing canoe and the canoe yawl. There is a further claim upon the title " canoe " which is in no way legitimate. It arises when some small yachts, heavy, bungling, deep-draughted chunbungoes, claim, because they have a sharp ended stern, that they are canoes. If this were admitted, is not a first-class battleship, with her sharp-ended stern, " a canoe "? Form, as we said in opening this article, must be taken in conjunction with capability of performing the duties common to all canoes such as navigating shallow waters, and with portability. Here it might be retorted—" You opened by bringing in a torpedo boat as of canoe form." Yes, but bear in mind that small torpedo boats can navigate in shoal water, can be hoisted on board larger ships, and can be portaged from water to water by railway train—whereas a battleship cannot.

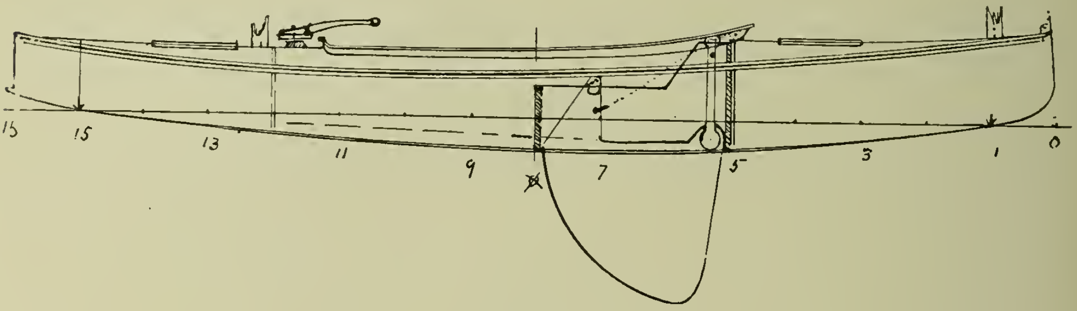


Fig. 1.—Cruising Canoe (p. 392).

Now the class to be wiped out is remarkable in its way—it is the racing machine class. It has grown upon the sport of canoeing as barnacles grow on a ship's bottom; it has grown upon fair canoeing, upon true excellence of model and rig, and upon good seamanship; it has engrafted the athlete and the acrobat upon the sport of canoeing. Neither of them was wanted, and the result has proved very bad for the sport—to a degree never anticipated when the old stringent rules of classification were relaxed.

While retaining canoe form of great excellence in the body of the canoe, and even in many of her fittings, such as centre plate and rudder and sail area, the relaxation permitted the use of the effect of unlimited beam as a sail-carrying power, while the rule at the same time limited the actual beam to a ridiculous minimum. The rule limited the beam of canoes to 30 in. (at the present moment 42 in.), and with the man sitting on his deck and leaning out to windward as the puff struck his craft, sail had to be carefully handled, the rig had to be perfect in all its working parts and more or less get-at-able; therefore there was necessity for a practical " well opening "—indeed, the early sailing racing canoes were as fully fitted and as able cruisers as any could be under the knowledge of the time. The relaxation came in, and though the beam of the canoe remains limited, the acrobat is permitted to use a sliding seat across the deck whereby he slides his whole body, legs, and all, right outside to windward, and thus obtains such an amount of sail-carrying power that he is more in actual danger of capsizing to windward than in the ordinary way of to leeward; he gains the advantage of nearly 8 ft. of beam without its disadvantage in surface, and yet this is over a limit of 3 ft. of beam, *i.e.*, 5 ft. advantage in a size of craft in which an inch tells as much as a foot does in a yacht.

In addition to the acrobatic plan or balance seat allowed by the rules (up to 1909), the racing machine is not required even to have a hole in her deck. Some canoes have been produced in England without any " well," or hatchway even; some here and in America had sails of standing rig, *i.e.*, not hoisting or lowering or reefable, but stuck in—as in model yachts. In these craft the sheets are trimmed for the leg of the course, and off she goes at gun-fire; the man is out on his slide, 4 ft. outside his canoe, and he can do nothing but steer and balance till he comes to the turning mark on the course. Here he quickly snatches a fresh trim of sheets for the new leg of the course, and off he goes again. If she gets an extra heavy knockdown puff and capsizes, all the agile acrobat has to do is to jump out on to the centre plate, which is now lying horizontal on the top of the water, and to prise the canoe up, using the slide-seat plank as a lever.

The true canoe, fitted to be useful and comfortable, otherwise than for mere "pot-hunting," has no chance in racing against this machine type of canoe and man. The racing class is now, by the legislation passed at the autumn meeting of the Royal Canoe Club, held in November, 1896, so well overtopped by the "cruising canoe" class that, "machine racing" being no longer a certain road to winning the chief cups and prizes, intending competitors will have at least the option of building a useful, comfortable craft with a very fair chance of winning prizes by sailing skill and merit, rather than by mere acrobatic skill and luck.

Of the various canoe clubs in England, unfortunately, no two have the same rules in entirety; there is no governing power, no canoe racing association. The "British Canoe Association" is not a legislative body, but is a club which invites other clubs and individuals to its annual camp-meet; and it holds handicap races, including boats. Of late, however, the senior club, the Royal Canoe Club, has thrown all its races open to members of all other recognised clubs, and to gentlemen amateurs. As such visiting competitors must build under R.C.C. definitions, the production of craft within these rules is steadily insinuating through the outports.

Thus far we see the history and state of canoeing up to 1897. It is useful to know what the sport has gone through. The struggles of the true canoe and the science of real sailing, against the highly successful raids of the racing machine and the acrobat. Now, in the spring of 1910, the sport stands on a very different footing: The sliding seat, and, indeed, the racing canoe, were abolished in the autumn, 1909; the sailing canoe rules have been completely altered to two classes of comparatively large canoes, found to be suitable for cruising work; and these rules are now guarded for reasonable terms of unaltered existence in that to alter the rule, even in the minutest detail, requires a four-fifths majority vote. Canoe yachts, and canoe yawls, are no longer considered as classes in the Royal Canoe Club and in the Clyde Canoe Club, the two leading bodies of canoeing in England and Scotland. There can be no question that the possibilities of canoe-travel over wide lakes and along sea coasts have been immensely bettered in the most recent designs of canoes, brought about by sound legislation in the clubs. The latest class, the A canoe, which is the leading class in the Royal Canoe Club and in the Clyde Canoe Club can be sailed fast and safely in wind and wave that would have stopped or sunk the old type of cruising sailing canoe. First cost of canoe has probably gone up with the increased size and the perfection of fitment; but as a man's small yacht, or travelling house-boat, she is good value in building cost, and absolutely the cheapest type of craft to run, in proportion to the work got out of her.

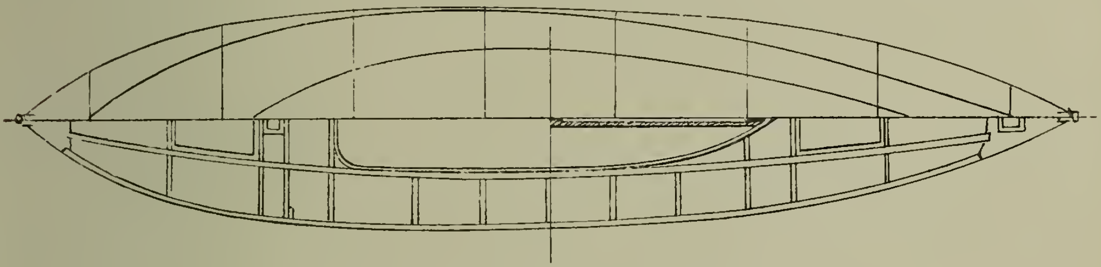
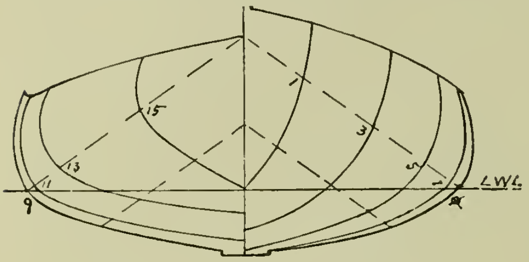


FIG. 2.—CRUISING CANOE. WATER-LINE AND DECK PLAN.

The rules of classification in the Royal Canoe Club are (1910): Sailing canoe:—

The "A" class canoe shall be sharp at each end. Length overall not exceeding 18 ft. Beam not over 4 ft. Depth outside from top of deck at middle line to under side of garboards anywhere up to 2 ft. from either end shall not be less than 12 in. Side deck not less than $\frac{1}{4}$ beam of the canoe. Plank not less than $\frac{1}{4}$ in., deck not less than $\frac{3}{16}$ in., and bulkhead not less than $\frac{3}{8}$ in. finished. One complete bulkhead not over 6 ft. from mid-length. Ballast, including any metal keel, to be not less than 130 lb. Sail area actual not to exceed 150 sq. feet. No seat shall be extended beyond the side of the canoe. Hatchway not less than 36 in. in length, and not less than 16 in. in width throughout that length. Unless otherwise stated in sailing race conditions, "A" class canoes are to be sailed single-handed.



CRUISING CANOE. BODY PLAN (SEE P. 392).

"B" class sailing canoes:—

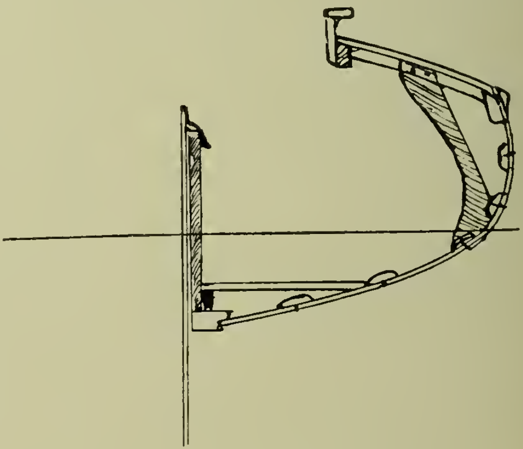
A "B" class canoe shall be sharp at each end. Length overall shall not exceed 17 ft. Beam extreme shall not exceed 42 in. Any excess of length or beam to be multiplied by 5 and added to the water-line length for rating purposes.[1] No seat shall be extended beyond the side of the canoe. Load water line shall not be less than 12 ft. 6 in., measured with owner on board in racing position. Minimum depth outside from top of deck at middle line to underside of garboard taken anywhere up to 2 ft. from either end shall not be less than 12 in. There shall be two fixed bulkheads of wood, which are to be not less than 5 ft. 6 in. apart, nor more than 8 ft. apart, and not more than 5 ft. from mid overall length.

There shall be a direct opening to the space between these bulkheads of not less than 16 in. in width for a length of 3 ft. The deck at each side shall not be less than $\frac{1}{4}$ beam. Scantling, minimum finished, plank, $\frac{1}{4}$ in.; deck, $\frac{3}{16}$ in.; bulkheads, $\frac{3}{8}$ in. Rating shall not exceed $0{\cdot}3\ \frac{LW \times SA}{6{,}000} = R$. In calculating the rating, figures beyond the second place of decimals shall be ignored. Sails: The certificate of rating shall be for one rig and suit of sails only, which may include a storm sail not exceeding 75 sq. ft. area. Only one certificate can be held at a time. The load water line shall be marked on the canoe to the satisfaction of the official measurer.

It will be noticed that, compared with the "A" class, the "B" rule is decidedly complicated, and owing to a variable quantity rating formula, a considerable divergence of sail area and length may be found in the boats of the class. Also, there being no weight stipulation, the racing man's scheme is to build as lightly as possible and to have a very light plate; consequently the "featherweight racing canoe" is invited, and she is expensive to build and fit, and requires most expert handling to keep her from capsizing. In the "A" class there is no question of rating; she has simply to comply with leading dimensions, allowed sail area, and to have no less than 130 lb. in her keel or ballast. This latter stipulation enables the man who puts that weight into keel to have an uncapsizable canoe without being at a disadvantage compared to others in his class when racing.

The Clyde Canoe Club "A" class rule differs only from the Royal Canoe Club rule in some extra stipulations added which have only the effect of tying a man's hands in the scope of his design. They are the above "A" rule, plus "centre plate to be liftable above the keel; sectional rise of bottom at two-thirds beam not over 4 in.; fixed draught not over 10 in.; main sail not over 125 sq. ft.; length of well opening not less than 4 ft.; width of side deck not less than 10 in; she shall have two bulkheads, or, instead, two end air-tanks."

There is no stipulation as to weight of keel, hence the "featherweight" trouble is within the class. The extra stipulations are merely what the cruiser of some sorts of waters would of himself put in, but they would bar some men who use other waters, or who want to keel-ballast the canoe, *i.e.*, by a liftable bulb plate, as to be uncapsizable. For large lakes, subject to heavy



CRUISING CANOE. HALF SECTION AT MIDSHIPS.

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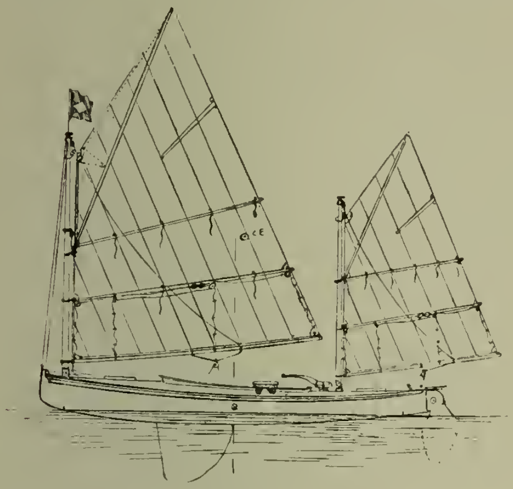
[1] The excess of length or beam mentioned is for small differences by accident in building or for visitors canoes of slightly over one or other limit of the rule.

squalls, this is a serious objection to the enforcement of a housing plate, and a direct invitation to the racing man's advantage over the safe cruiser. It is intended to facilitate beaching, but that is a mere convenience, and craft have been fitted with bulbed plates where the bulb remains outside the case, close up under the keel, and such craft can be beached with sufficient ease when necessary, while all the time afloat they are far more seaworthy.

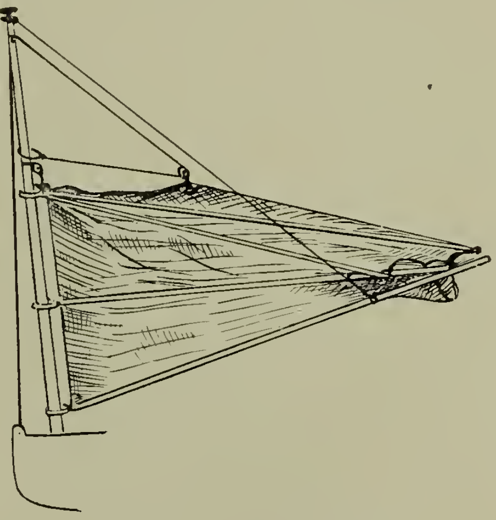


SPREET SAIL FOR CRUISING CANOE.

The "B" class of the Clyde is 18 ft. by 3 ft. beam, and 85 ft. total sail, so it does not fit in with the Royal Canoe Club "B" class. But the latter would go in the Clyde "A" class with great effect. The racing of the Clyde Club is on Loch Lomond, a place which, except under the shelter of the islands, can be very rough and dangerously squally; but it does not blow every day; anyway, knowing the waters, I should say that a sailing canoe of the English "A" class would have lovely cruising on the loch, whatever the weather may be. On the whole, one must regret that club rules too often introduce uncalled-for restrictions, which are vexatious to the expert canoe man, and utterly puzzling to the novice. It will be seen in the long-time history of the sport, above given, that ill-considered legislation has at times played havoc with the sport, and that, as the racing sport to a large extent places canoes on the sale market, the endeavour of the clubs should be only to countenance rules which will furnish, under the best obtainable simplicity, a good type of cruising canoe.

Of course, with the progress of years, canoe fitting has become in many ways—far too many and technical here to set out—more perfect for both racing and cruising, but the type of canoe and rig depicted in this article shows a canoe that would be hard to beat at average travelling work. The modern underbody rudder, the roller foresail, the roller reefing mainsail, and several other novelties, are more racing than cruising improvements. They have appeared from time to time in the *Field*—with scale drawings—and, if put together, would make a fat book. Certainly the extra beam now in favour gives far more comfort in cruising than was ever known in old days; but paddling ability, of course, falls off with size, weight, and beam. I have, however, found when cruising in company with the paddleable canoe of older type that the perfect sailing qualities of the modern sailing canoe put me easily ahead in all conditions except a dead calm; and at night my comfortable quarters were palatial compared to the old 30-in. craft.

The use of the canoe-yawl is that she can (or she is faulty in design if she cannot) do all the sea-going work which can be got out of a small yacht, say, up to three or four tons; she can accommodate her one or two "crew" (according to her size). She can be hoisted on a yacht's davits, or on to a railway truck, or be carted for transportation to any part of the country, or on a steamer, or on her own wheel-carriage; she can be housed in a shed or boat-house; she needs no professional crew. Where the yacht cannot go the yawl can go—that is, into harbours which are all but "dry"; she can also go up shallow creeks and rivers. In short, she gives the least expensive and the most extensive form of yachting. So far as open sea is concerned, a well-built



SPREET SAIL. SAIL HALF LOWERED.

and fitted canoe-yawl with a liftable bulbed centre-plate would do all the work that has been done by small boats crossing the Atlantic, and at about one-third the risk that they encounter.

The "cruising canoe" can do very nearly all the work which a "yawl" can do, but of course must be put to it with greater caution. Those who "fears nothing 'cause they knows nothing," as was said of the Brighton trippers when out sailing, have no business to go canoe-sailing; they only bring a bad name on the sport and a silly end to themselves. It does not follow that an expert yachtsman can sail a canoe; quite the reverse is my experience; but an expert canoe-sailor is seldom at fault in yacht-sailing—indeed, many of our best yacht-racing men have graduated in sailing canoes.

General Type of Canoe.—As before said, it would be too long a matter to give description and drawings of the numerous types and models of sailing canoes of the present day, or of all their fittings. I therefore confine myself to giving a scale drawing of the general purpose type, the "cruising canoe"[1] (and a drawing also of the "A" class canoe and her sail plan). More properly it is the "sailing canoe," in which both cruising and successful racing may be enjoyed. The same model enlarged makes an excellent canoe-yawl, and the racing man will find that he cannot depart very far from her lines and principles in attempting to produce a racing machine—that is, a successful machine—so she may be taken as typical of canoe-sailing in general, leaving variations of detail to those who desire special racing or special cruising qualities. In the elements of design which go to make a sailing canoe the leading principle to which the designer has to give way is "compromise." Every item in the above design is fixed to an eighth of an inch by reason of compromise; if one went boldly for one desirable quality, probably half a dozen other useful, if not actually needful, qualities would be sacrificed.

It will be seen, of course, that the body plan from which the building moulds for sections are taken is drawn at double the size of the other plans; this is on account of space in the publication. The sections given are 2 ft. apart. commencing at 1 ft. from the fore side of stern. There are watertight transverse bulkheads at No. 5 and at No. 12 stations. There is just comfortable space to sleep in (that is, for anyone accustomed to canoe-camping). The masts step in watertight cases so as not to let rain drain into the stowage spaces, which, it will be seen, are got at through the two hatchways. The centre-plate can be unpinned and then lifted clear out of the canoe; it should be 80 or 100 lb. in weight. The canoe is preferably built in the manner known as ribband-carvel—that is, ¼ in. or ⅜ in. planks are brought edge to edge as in ordinary carvel building, but here ribbands of ⅜ in. × 1¼ in. mahogany are laid fore and aft on the inside and cover the plank joint, the plank edges being riveted or screwed into the ribbands. It forms the strongest light build, and if well done is least liable to leak or crack; the only "timbers" or frames required are one at each bulkhead and one at ×. Sometimes, small steamed ribs are let in next the plank to help it stand bumps, but they weaken the ribbands for a certainty.

All such fittings as hatch-covers, drop-plate rudder, deck-steering yokes, tillers, wheels, cleat racks, centre plates, spar doors, indeed a hundred and one important little fittings have from time to time been perfected till their working is now certain, but a description even of the necessary fitments would be far too long for this article.

Sails.—Possibly the sail plan will give those who are novices to canoe detail the best general idea of the canoe as a whole. As to any particular sail plan, or even type of sail, it is extremely difficult to decide which is better than another—it depends so essentially on the proficiency of the man who is to use it. Simplicity in rigging is often as dangerous as the greatest complication of strings and blocks can be; I have myself worked out six distinct types of sail, and among them I have even now difficulty in picking the one likely to be most suitable all round; but taking that which I have myself found very effective for sailing and handy for cruising, I give a drawing of it, and remind my readers that the rigs of all kinds are fully represented in all detail in *Canoe Travelling* and in *Yacht and Boat Sailing*.

There is one elementary point in regard to canoe sails which should always be present to the mind of anyone about to rig a canoe or desirous of criticising any given canoe rig design: it is that a boat's perfect rig may be a canoe's poison; the crew of the boat or yacht can stand about and move fore and aft in her, but the crew of one man in the canoe must do everything from one position and must handle the boat at the same time that he manhandles the sails. This may be appreciated on drawing a sectional sketch of the canoeist sitting out on his slide deck seat; he steers with a "flail" handle to his tiller. Assume that an extra heavy streak of wind now lays his canoe flat; he must either "spill" his sail by letting go his peak halliards, or he must jump on to the centre-plate to right her. The "sheets" must be kept fast, otherwise the sail goes into the water more and more, and when he rights her by balance, the boom with the sail full of water swaggers out on the opposite side and probably capsizes her again; indeed, it will do so time after time.

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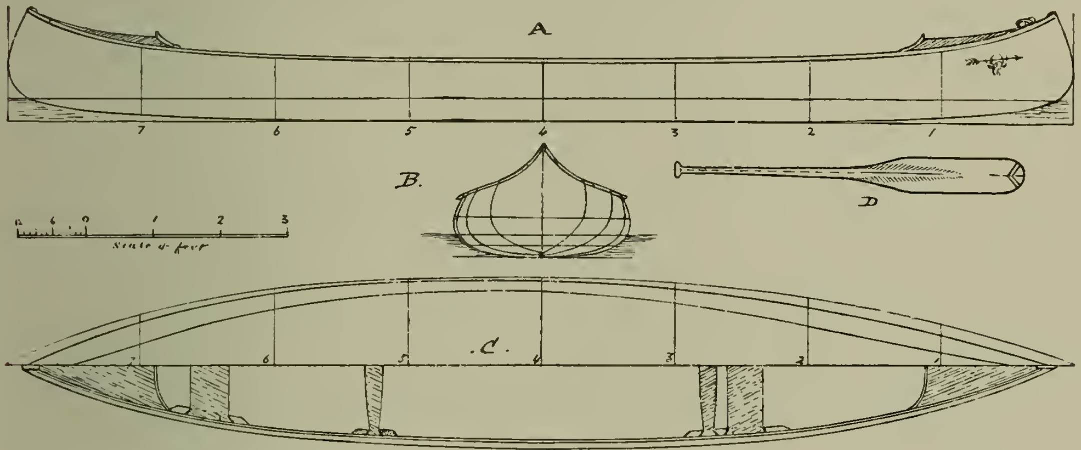
[1] See Figs. 1 and 2, pages 388 and 389.

There are many who say the sail should be on single halliard so as to come down on one string being let go. I am certain from long experience that, at the "agony angle," it never will come down, and therefore prefer a main, or jaw-halliard, and a dangerous in "gybing"; the boom does not top up, and it either hits the man in swinging across or it goes smash into the water. Hence abaft-the-mast rigs are growing in favour from the handling point of view.

Of all the rigs I have tried and have seen tried, the hoisting-spreet rig is about the best; it gives the shortest spars for area, and if neatly rigged is the most capable of many changes and uses. In 1870 I brought out a hoisting-spreet, but it had the fault then of being practically a standing-spreet so far as its spreet was concerned; it was really a sliding-gunter spreet. Since that time, finding it a most effective sail, I modified or improved the idea till I got to what may be called the lowerable-spreet, and in 1885 and 1886 I rigged sails of this nature, only differing in that one was a proper peak halliard. The peak halliard on a puffy day can be carried in hand from tack to tack and be worked far more effectively than the sheet, provided the boom is held by its topping lifts. In such weather the mizen of course must be reefed—that is to say, except in close racing. Caution is the first quality of a seaman—dash and daring go with caution, but there is no such thing as a foolhardy seaman; a foolhardy man is no seaman. On the mizen no jaw-halliard is necessary, but it may well be fitted, and I prefer to have it; it is only one extra line, and it has many uses. Perhaps, however, this is going too far into refinement of sailing.



Open . paddling canoe
canadian . type

THE RIVER TRAVELLING CANOE.

Of the many rigs which have been used, the balanced battened lug is probably the most popular and possibly the most effective, but it has some decided faults for those who sit high on a deck seat. It is the most spreet-sail hoisted by the luff-rope and head-rope at the throat angle (see p. 391, col. 2), and the other had a luff-yard and a spreet so as to use a shorter mainmast. In effect, that rig was a gaff main-sail with a jib-headed top-sail, the yard of which did the duty of a topmast. This sail has since been produced, we will not say copied, on several American canoes, but they all miss the very point of the rig for which I brought it out. As we are not here dealing with the refinement of detail of a racing rig, I take the hoisting and lowerable spreet-rig as the most simple and effective rig—that is, the roped luff-sail. The sail plan[1] shows this rig set and a sketch shows it partly set, or also partly lowered, as it can be for a heavy squall or a bad gybe, or for coming into port among a lot of craft. In this case the main or jaw-halliard is kept fast, and the peak is lowered. The luff-rope on the sail must be strong, and dressed with linseed oil so as not to stretch or be affected by wet or weather.

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[1] Given on p. 391.

The sail plan shows a big mizen; this can be shifted into main position and a small mizen can be then set aft, the mainsail and spars meanwhile lashed along on deck; this is specially useful in bad weather or when a night trip has to be made. All the riggings and the semi-automatic reefing gear are fully described in the books I have already mentioned, and they are of the first importance to the successful working of the rig.

Canoe design, of course, is never finally perfect, but with increased experience certainly a better craft is produced to-day than ever saw the water in the early years of the sport. It is, therefore, that, with permission of *The Field,* I reproduce here my design for a canoe of the newest, the "A," class. This canoe and all about her abilities, reasons, and fittings appeared in *The Field* of March 20th, 1909, and April 3rd, 1909. Since that publication I have had the canoe built, with one or two slight differences of fitting, and so on, made for racing, as a general purpose canoe, specially intended for lake cruising, and camping in. One difference (see drawing of "A" class) is that my plate with its bulb is different in shape, and is "hung" in the manner shown in the cruising canoe (Fig. 1), and so it is liftable up and out of the canoe, a very useful feature in cruising. The plate is 65 lb., and the lead plates on its lower end about 75 lb.=140 lb. Now a pound of fact is worth a ton of fiction in a squall, and I can say from frequent tests that with this keel, with the centre of the lead at 3 ft. below water line when upright, the canoe is uncapsizable; she has been knocked down flat on her side by a squall, often, so can any yacht, but she will right again immediately if the wind eases off, or the craft is brought head to wind. The wide side deck has prevented any water being shipped when she is flat, and the two bulkheads give her reserve flotation. So she is by actual experiment, in ordinary sailing circumstances, a *safe craft,* uncapsizable, unsinkable.

The model is of modific "coble" type, and when the rudder is housed, as dotted in drawing, and the plate is up, she can be beached stern first in a considerable sea. If rowing be adopted, she will row stern first best, as all cobles do, and she will tow stern first steadily.

The rig shown is standing lug with roller reefing, 125 ft. in mainsail, and 25 in the roller-foresail. The mast is shown fitted to lower; this is a great comfort in travelling where bridges are commonly met, but for racing or sea work the mast should be stepped down to the keel. The keel shown in the drawing is rather masive for a canoe, but this design was made with a view to lake work, and though sandy bays may be found, gravel shores and stones are more common. The flush garboards and no protruding keel, found in nearly all of the "B" class canoes, would cause the bottom of the canoe to be chewed to pieces in one or two rough-wind landings before she could be hauled up.

A lighter plate could, of course, be carried for cruising, provided sail is reduced. The lifting power of the man is the test of how much weight there may be; assume that the owner can lift a plate of 100 lb. in and out of the case; he would probably find that a rig of mainsail 80 ft. and foresail 20 ft. (or mizen) would be as much as he could usefully carry on a wild, squally lake, whereas on a river he might carry 150 ft. or more. But the rule requires 130 lb. for ballast, so the owner's judgment as to best mode of ballasting should only be warned that below 130 lb. she would be capsizable.

Designs of Paddling Canoe.—The drawings here given of an open canoe of Canadian type,[1] show a canoe 16 ft. long by 32 in. beam, 7½ in. freeboard, and 4 in. draught of water. She would on that draught displace about 480 lbs., so that, if the canoe comes out, say at 72 lb., with all her gear, canvas, pack, &c., and the crew at about 308 lb., she would carry about 100 lb. of camp and other gear. The midship pack of gear, spoken of above, would fit between the two cross-beams, with 6 in. of it tucked under each. The cross-beams are built into the canoe, but the seat thwarts, shown shaded, are dropped in, dove-tail fashion, so as to be removable; the cross-beams can also be so fitted if it is intended to sleep in the canoe, and to remove them.

Paddles, single blade, are usually 5 ft. 6 in. long; but a much longer one is often useful, and at least a couple of spare paddles should be carried on a cruise. A jointed double blade paddle is often favoured, but is only advisable when a single hand is to work the canoe, and the journey is mostly on quiet flowing rivers or canals. For navigating rapids or lakes with two men in the canoe, far more effective work can be done with "single blades"; these should be of the toughest

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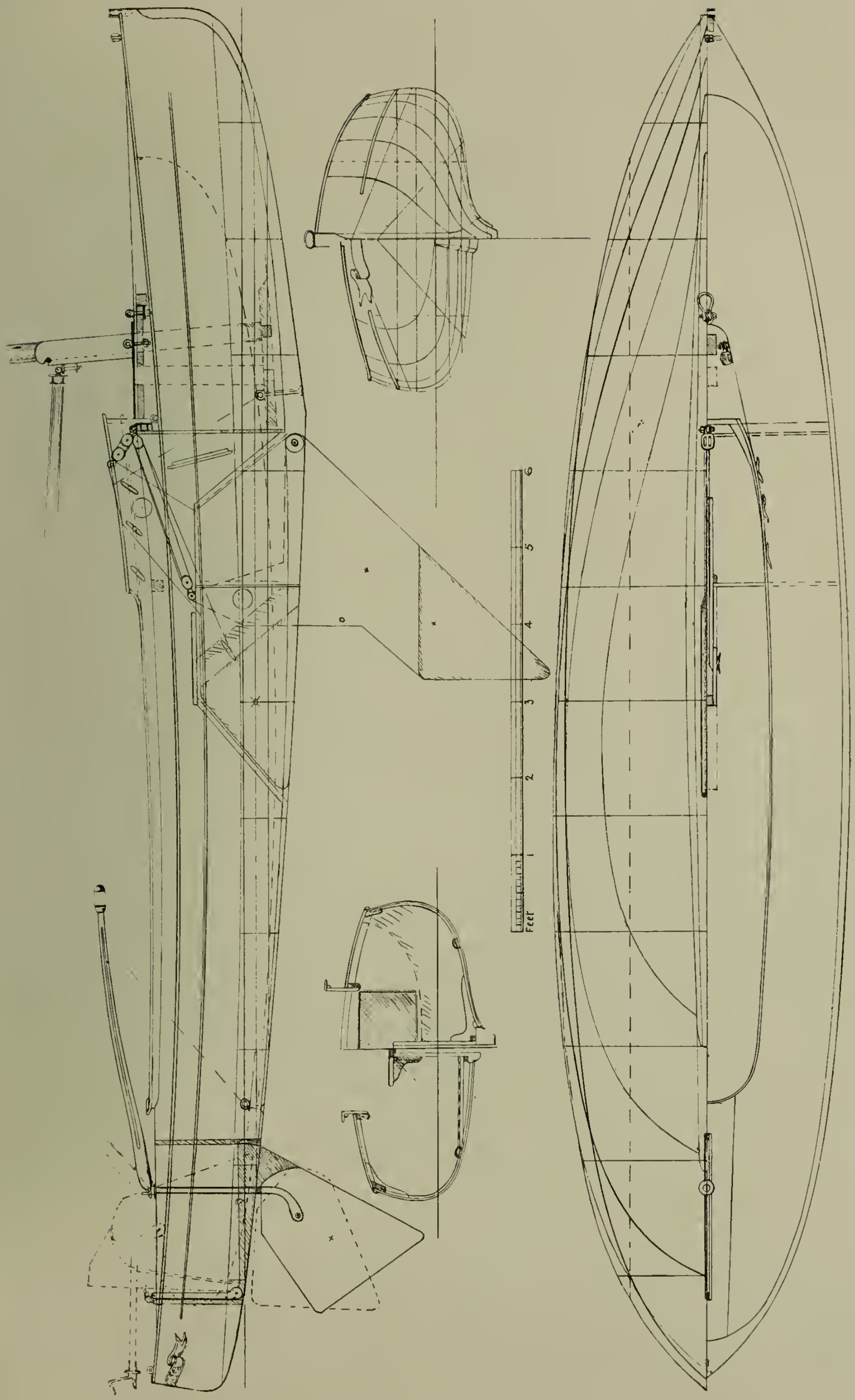
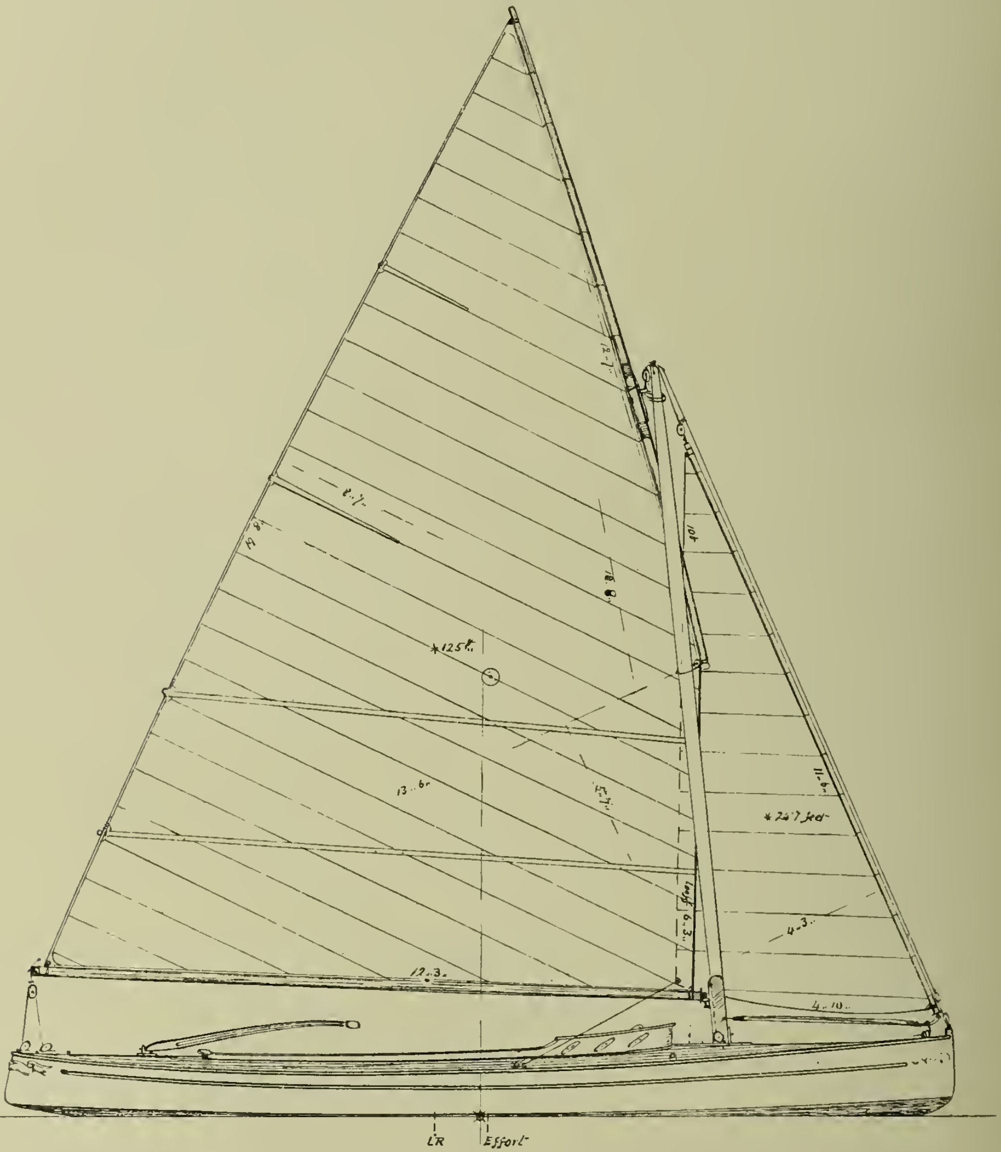
[1] See drawing on p. 393.



"A" Class Sailing Canoe of the R.C.C. Rule 1909.

wood, even at the expense of being a trifle heavy, and they should be protected at the blade end by copper ∧-shaped bands riveted on each side, as shown in the sketch.



"A" Class Sailing Canoe.

For ordinary river work, nothing looks better than varnished cedar or mahogany, built up ribband-carvel fashion, such as may be obtained to perfection at Turk's, at Kingston-on-Thames; they are amply strong enough for all but the roughest camping cruise. These Thames canoes are run very close in build and finish by the canoes of the Stricklands of Lakefield, Ontario (which can be got at Strickland's depot at West Drayton, England). But for rough, knockabout work, probably the Macatawa sheathed canoe, of North American Indian model, would be found the most lasting; and of course for real cruising work, appearance goes for nothing compared to efficiency.

The Macatawa is a wooden-built and planked canoe, sheathed with a tough prepared fabric, cemented over the outside and finished with repeated coats of paint; the life of such a canoe among rocks and snags must be immensely superior to that of the ordinary wooden canoe. G. Harris, of Laleham-on-Thames, imports these canoes.

As to price, a 16-ft. open canoe with three single blades should not exceed £18.

THE INSIDE OF A TRAVELLING CANOE.

Many of them can be got at "a guinea a foot," and the best of finish, with carpets and cushions, comes to about £20, complete.

Clubs, &c.—The institutions for the promotion of the sport of canoeing, though not very numerous in England, are sound, going concerns with solid capital; they have, or the sport has, suffered much in the last ten years from the rapid growth of small yacht sailing and cycling. The small yachting, in half-raters, was injurious to canoeing; but many men are now finding out to their cost that a half-rater racing machine is not a bed of roses, even for the pleasure of sailing, and is a little heap of expenses out of all proportion to the sport it furnishes, and such men are coming back to canoe sailing and cruising.

The Royal Canoe Club leads canoeing in England; its headquarters, or club house, is on the Thames at Kingston, and in 1897 a new and permanent club house was erected with all conveniences for housing members and their canoes. The paddling regatta, including some sailing, is held annually on the Thames at Kingston, and the sailing regatta, a fortnight's racing, is, in 1910, at Aldeborough, a salt water, and fine, open, sailable estuary in Suffolk. The club has two £50 challenge cups, one for paddling, the other for sailing, and gives a large number of prizes for all classes of canoes.

The Mersey Canoe Club at Liverpool is almost as old as the Royal, and is a very stable and sporting institution. The "Mersey" has not given way to racing quite so extensively as the older club, but none the less it has produced some very excellent canoe sailors, and some canoes and canoe-yawls of considerable merit. Knowing the Mersey well, I have no doubt that were the Mersey Canoe Club now to institute a useful class of sailing canoe, and to give a substantial programme of Saturday racing for the season, the canoe would, on the Mersey, above all places around our coast, show itself in front of small "raters" and open boats in giving sport and pastime for money expended, and the club would have to look for a more extensive boat and club house on the influx of members. The Clyde Canoe Club, now housed on Loch Lomond, is in every way flourishing; its two sailing classes are nearly the same as the Royal Canoe Club classes; it holds a number of cruises and races throughout the season, and has a large membership.

It is impossible here to go into the history or even description of all the canoe clubs, or to decide whether some are not more properly "sailing boat" clubs; and as some of the clubs are so bashful of appearing in print, it becomes difficult to know whether they are flourishing on thousands of pounds of capital, or have become shelved on the glory of past attainments. There are, or were up to a late time, the following clubs: the Humber, the Wear, the Tyne, the Sunderland, the Northern (on the Tyne), the Ulster, the Midland, and the Forth.

A TRAVELLING CANOE AFLOAT.

The real commanding charm of canoeing over all other aquatic sports is that where there is water there is the canoe's sphere of action. It matters not whether the water be sea or a mere brook, a lake or a fish pond, canoeing can be more or less enjoyed, especially if the right type of canoe for the nature of the water is chosen. The canoe, in one form or other, may be an adjunct to yachting, to fishing, and to shooting; she may be useful for travel, for exploration, or even for war; but, above all, the sailing canoe on moderately open water is the finest of health-givers, and is so at the least cost. The canoeist can at his own will sail alone or elect to sail in company; not so the yachtsman, who must have a crew, if not guests also. The canoeist can carry his hotel with him; not so the shooting or fishing sportsman, the hunting man, the cyclist, or the golfer. All these are dependent on house or hotel when the sport is over, whereas living in a canoe is part of the sport of canoeing.

WARINGTON BADEN-POWELL.

GLOSSARY.

Apron.—The mackintosh cover put over the canoe "well" opening when the canoeist is seated in the "Well" (*q.v.*), in order to prevent waves from splashing into the body of the canoe. It is not infrequently replaced by a sliding wooden **Hatch.**

Back-board.—A board usually hung from the deck coaming, or the bulkhead directly behind the paddler, against which he leans, and presses his back when paddling; his feet giving pressure from the foot-stretcher.

Beam.—The greatest width of a boat.

Bearings.—The line of flotation formed by the water upon a boat's side and bottom when, with all on board, she has come to the angle of best stability for such displacement, or sail pressure.

Brace.—[*See* STRETCHER.]

Burdens.—The boards laid upon, but not fixed to, the lower part of the frame of the canoe. Also called **Floor-boards.**

Camber.—The arch of the deck from one side to the other; contrasted with **Sheer,** which is the curve fore and aft.

Canoe,—A light boat, sharp modelled at each end, of light draught of water, and destined to be propelled by a paddle or paddles held in the hand without fixed support. There are three main types.

(1) The *open, Canadian,* or *undecked* canoe, used for paddling purposes only, and accommodating any number up to ten or more. The native boats are mostly of *birch bark,* but those of the same pattern imported into England are usually of *bass wood.* They are all built with a smooth skin, *i.e.,* the planks do not overlap one another, but are put side by side and caulked or ribboned.

(2) The *Rob Roy,* called after the pseudonym of Mr. John MacGregor, the father of modern canoeing. This is a decked canoe, generally built of oak or cedar, for one or two persons, and able to carry a small sail, but chief reliance is placed upon the paddle. The average length of this type is 14 ft. by 26 in. wide. It is always clincher-built.

(3) The Nautilus type and the developments from it. A larger *Rob Roy,* designed by Mr. Baden-Powell, with a view to improve the sailing powers and quality of the craft. Like the *Rob Roy,* it is generally clincher-built, but the larger sailing canoes are now built with smooth skins, and approach very closely in general character to the ordinary sailing boat.

Paper boats are extensively used in America, but have not been adopted generally in Europe, and canvas canoes are frequently built by amateurs, though seldom seen from boat-yards; the canvas canoe is, with suitable internal structure or frame, about the toughest for real rough work.

Carvel-built.—A boat with flush, edge-to-edge planking.

Coaming or **Combing.**—A thin plank on its edge fastened around the "well" (*q.v.*), to prevent the water on deck from running below.

Cock-pit.—[*See* WELL.]

Drip-cups.—Leather cups set around the shaft of the paddle to catch the drippings from the blade.

Dug-out.—A boat consisting of a log with the interior dug-out or hollowed, the primitive form of the canoe.

Floor-boards.—[*See* BURDENS.]

Nautilus.—[*See* CANOE.]

Paddle.—A short kind of oar, held in the hand, and not resting in a rowlock, provided with one or two *blades* or *palms.* The usual length is about 8 ft., and the width of the blade about 6 in.; they are usually made of pine or spruce, and consist of blade, round or shaft, and ferrule.

Palm.—[*See* PADDLE.]

Portage.—(1) The carrying of a canoe round overland past an impassable bit of river or sea.

(2) The place of such carrying.

Rob Roy.—[*See* CANOE.]

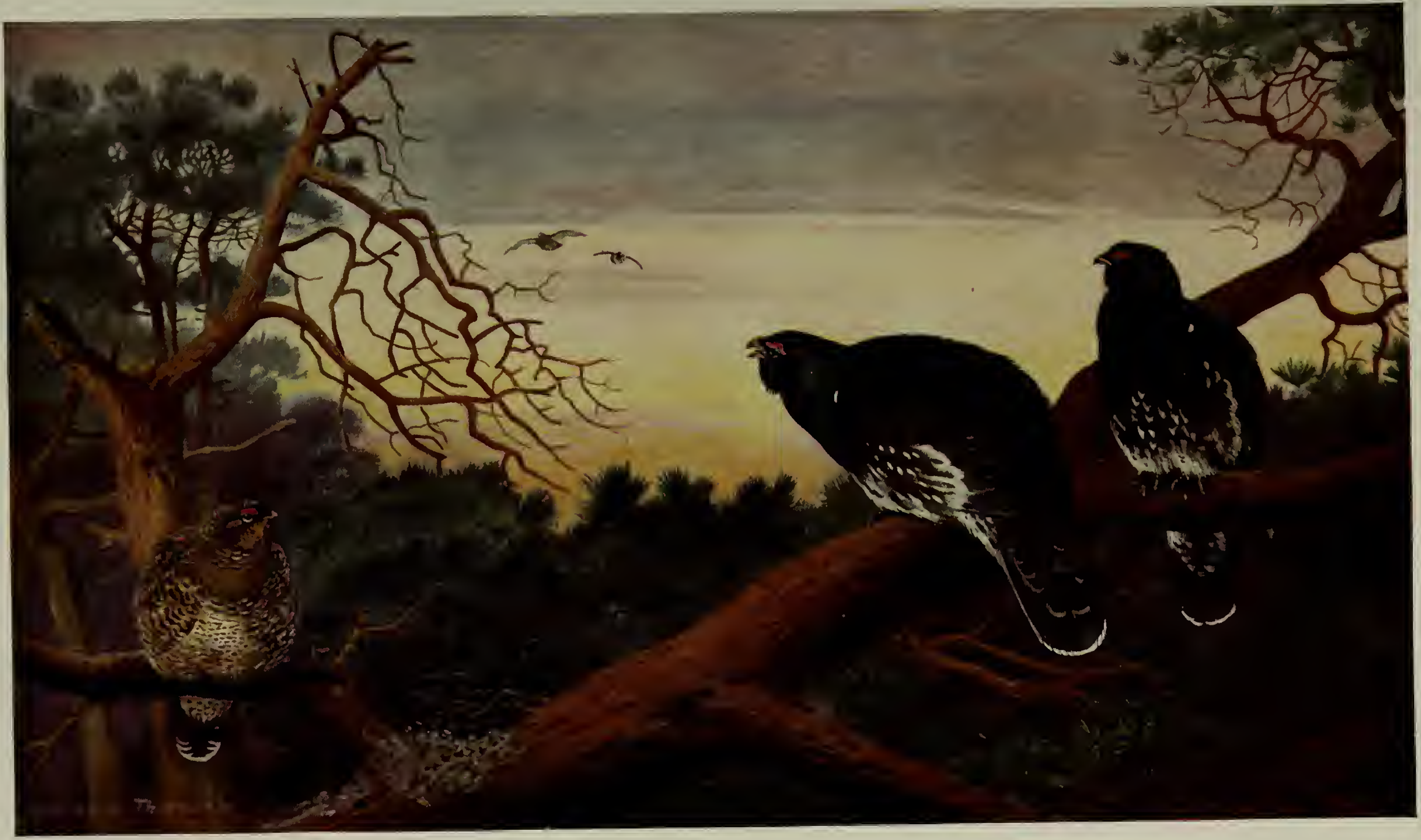
Round.—The shaft of the paddle.

Stretcher.—The board against which the feet are pressed to steady and enforce the stroke.

Well.—The opening in a decked canoe to admit the putting in of cargo and to accommodate the crew.

Bibliography.—*Description of the New Rob-Roy Canoe,* J. MacGregor (Sampson Low), 1866; *A Thousand Miles in the Rob-Roy Canoe,* J. MacGregor (Sampson Low), 1866; *Canoe Travelling,* W. Baden-Powell (Smith and Elder), 1871; *Encyclopædia Britannica,* 9th edition, article, "Canoe," J. MacGregor, 1876; *Canoe and the Flying Proa,* W. L. Alden (N.Y.), 1878; *Voyage of the Paper Canoe,* J. R. Bishop (Douglas, Edinburgh), 1878; *Practical Canoeing,* "Tiphys" (Norie and Wilson), 1883; *Canvas Canoes,* P. B. Field (Forest and Stream Publishing Co.), 1887; *Canoe Handling,* C. Vaux (Forest and Stream), 1888; *Canoeing and Camping Out,* J. D. Hayward (E. Bell), 1893; *Across the Everglades,* Hugh L. Willoughby (Dent), 1898; See also Yachting.

CAPERCAILZIE [**Cock o' the Woods;** *Tetrao urogallus; Coq du bois,* Fr.; *Tiur,* Nor.; *Tjäder,* Sw.; *Auerhahn,* Ger.; *Gluhar,* Russ.].—This magnificent bird, the largest of the grouse tribe, among English sportsmen termed shortly "the Caillie," is described over nearly the whole of Northern Europe wherever large forests of pine or fir exist, and over portions of Central Europe, where the same trees abound at a considerable elevation. Woodlands consisting solely of deciduous trees, however extensive, it never inhabits. But although common in parts of Germany, Austria, Switzerland, and elsewhere, the vast tracts of North-west Russia and the Scandinavian Peninsula may be regarded as its peculiar home.



After Archibald Thorburn.

CAPERCAILZIE.

In Scotland.—Said to be indigenous in Scotland, it there became extinct, until early in the present century the then Marquis of Breadalbane re-established the Scandinavian breed in the woods of Taymouth Castle, whence it has spread over various parts of the country similarly suited to its habits.

Favourite Haunts.—Its favourite haunts are ranges of pine forest broken by rocky ravines and low cliffs, with open tracks of mossy swamp, coarse herbage, and frugiferous shrubs, whither it can resort for food at early morn and before dusk. It is also partial to wandering on the borders of forest clearings, and makes such habitual use of cattle-paths and other rough woodland tracks as to be easily trapped. Great numbers of frozen Capercailzie are exported during the winter from Russia and Scandinavia. At that season, when the snow lies deep, it feeds on the shoots of the pine until its flesh becomes unpleasantly impregnated with turpentine, but in Northern countries affording abundance of wild forest fruit, bilberries, cow- and bear-berries, cranberries, and the like, the young birds are, in the autumn, delicious eating, and the old ones at least well-flavoured and free from taint. The richly sombre plumage of the cock Capercailzie, its defiant head and eye, strong beak and marked beard, all suggestive of its notorious pugnacity, render it one of the most strikingly handsome and game-like of birds, and its great size and weight make it one of the noblest feathered prizes that the sportsman can secure. It is the stag royal of the winged race.

Driving.—In Scotland and most Caillie-producing countries it is often customary to drive the birds over the guns, and the ease with which driven Caillie may be killed is by no means proportionate to their conspicuousness as a mark. To a novice, at least, their flight is most deceptive, inasmuch as they appear, from their bulk, to be moving but slowly, whereas they are, in fact, travelling at a great pace. Many sportsmen, however, will derive greater satisfaction from bagging the giant grouse under conditions less artificial and demanding more individual patience and woodcraft. There are, indeed, few wild creatures more wary than a truly patriarchal cock Capercailzie; he can on occasion run like a hare, and even when taking wing within distance, either from the ground or the branch of a tree, has an instinctive knack of interposing obstacles between himself and the gun. His pursuer, whether searching the pine-clad ravine, the depth of the forest, or the borders of the morass, cannot be too cautious or noiseless. Elk-dogs of the smaller breed are in Scandinavia occasionally trained to work up to Capercailzie in a leash, a deadly method of approach.

The Hen [*Röc,* Nor.; *Tjäder-höne,* Sw.].—The hen Caillie, also of noble size, but often wholly out of proportion to her gigantic and polygamous mate, is a careful mother, keeping the young brood together at the commencement of the shooting season, and exhibiting, like the grayhen, much noisy, self-exposing anxiety when danger threatens.

In favourable localities, as when the brood has run down into a willow-swamp to feed, the young cocks will lie well, and may be killed over a steady dog. A hard-hit Caillie will, after a considerable flight, possibly out of sight, almost invariably fling himself under the first, even inconspicuous, bank or ledge on either side of his course, and there die or lie still; he may, therefore, by observation of the flight and the ground, often be gathered without difficulty.

In the spring courting-season the cock Capercailzie's wariness is intermittently dominated by amorous ardour. Posting himself at daybreak on the branch of a selected tree, he thence utters his love-call to the hens, and during each brief repetition thereof becomes absolutely deaf and blind from passion. The watchful gunner has therefore as many correspondingly brief opportunities of approach, but must, when the call ceases, remain instantaneously rigid in his then position, for his intended victim suddenly regains his acute senses, and the slightest sound or motion proves fatal to the stalk. Devotees of this sport describe it as intensely exciting and fascinating, which is naturally a matter of taste. *Tetrao urogalloides* (*Rakkelhane,* Nor.) is the hybrid between the Blackcock and hen Capercailzie.

HENRY POTTINGER.

CARIBOU.—Owing to the inaccessible nature of its haunts, the life-history of the Caribou is involved in some obscurity, and it is not quite certain whether there are two species, the Woodland and the Barren Ground (*C. tarandus* and *C. tarandus arcticus*), or whether they are not both merely varieties of the European and Asiatic Reindeer. The forms certainly seem to intergrade, so as to make it difficult to draw any specific line; but the extreme varieties have very different habits.

The **Barren Ground Caribou** wanders far beyond the Arctic Circle, into those desolate regions which it shares with the Musk Ox, and it indulges in very curious and extensive migrations in the spring and fall, these migrations being in some respects different for the two sexes. When migrating, the herds assemble in enormous numbers, as the Bison used of old on the great plains of the West, and the Spring Buck in South Africa. In fact, this is the only American mammal which can still, at certain times and places, be found in the same incredible numbers as of old; for it is protected, as Bison, Elk, Deer, and Antelope are not, by the remoteness and frozen desolation of the wastes where it dwells.

The **Woodland Caribou,** on the other hand, is a beast of the dense Northern forests; in most localities it does not possess any very marked habit of annual migration, though at all times a restless, wandering beast; and it is usually found in small parties, and never in immense herds. The Woodland Caribou is found here and there in the forests of Canada, from the Atlantic to the Pacific, and in two or three places penetrates across the border of the United States. Like all other large game, it retreats before man, but nevertheless it holds its own against him better than most of its congeners. Caribou are more plentiful in Maine at present than they were thirty years ago. They have one very great advantage in the struggle for life over their giant cousin, the Moose, who so often dwells in the same forest with them. The Moose's long legs and vast power enable him in winter to go through snows where an ordinary deer flounders helplessly; but, when the snows are very deep and a crust forms, he can be run down and killed, with no difficulty beyond the severe toil involved, by any hardy man who is an expert snowshoer. In many localities, in consequence, the settlers have completely killed out the Moose by this villainous habit of "crusting." The Caribou, however, is not, like the Moose, forced to plunge his legs through the snow to hard ground; he possesses huge splay hoofs and very limber joints, so that he himself has snow-shoes, as it were, and only under very peculiar conditions of crust is it possible for any man to get near him. When plunging at a gallop through the snow, the tracks he makes are not unlike those of a gigantic Rabbit; for the limber hind legs take his weight almost up to the hock. I have seen a Caribou run right away from a party of expert snow-shoers without showing any distress, though in snow where a Moose would have been overtaken in half a mile. This capacity tells immensely in his favour, and more than offsets the fact that under ordinary circumstances he is less wary and more stupid than the Moose.

The best time for hunting the Caribou is when there has been a light fall of snow, and he can be tracked while the footfall of the still-hunter is muffled. But in good ground he is not a very difficult beast to kill earlier in the season. He is very fond of lurking about the barrens and cranberry bogs which dot the Northern forests, and, if the hunter can see him here, there is always a good chance to creep up on him. In thick timber, where the trees are close together and there is much brush, with crisp, dry leaves on the ground, it is exceedingly difficult for anyone but an Indian to get up to the Caribou, or indeed any other kind of game. In open forests of large conifers, however, I have found it easy to track and still-hunt Caribou, whether they were feeding or lying down. If one is close on the game, they will often be so panic-struck by the first shot that it is an easy matter to kill several if there is need of the meat. I have had a young bull, whose companion I had just shot, stand looking at me fully half a minute in paralysed terror before it made up its mind to run off unmolested, as I did not want to kill it.

CARIBOU.

The sight of a Caribou seems scarcely as quick as that of the ordinary Deer, nor are its other senses so sharp, though like all game it has a good nose. It is not so wary as the Moose; but I may remark in passing that my own experience has been that under like conditions the common American or White Tail Deer is the most difficult game on the continent to circumvent; doubtless it is for this reason that it holds its own in the land better than other beasts of the chase.

Caribou are great swimmers, and it is a very common thing to kill them in the water. Of course, however, no man would kill game swimming for sport, although, when exploring and travelling in the wilderness, any man must kill the animals he needs for food, just as he happens to come upon them. It must be remembered that the wilderness hunter, the man who roams through far-off wilds in chase of big game, cannot afford to give law to the beasts of the chase, as can his brother of civilised regions, who does not depend for his dinner, and perhaps for his life, upon the result of a single shot. Where parties of sportsmen merely take a three weeks' trip into the woods for Caribou, they of course kill only the bulls, and these only in legitimate fashion; but a man who travels for three months without seeing a single white face, or who spends his winter alone 500 miles from the nearest human habitation, cannot afford to take chances. If he finds a favourite pass in a lake, across which Caribou swim, he will kill them at this pass; and if, during the time of short rations in midwinter, the conditions of the snow enable him to run up to a herd on snowshoes, he takes all possible advantage of the opportunity. [*See also* REINDEER.]

THEODORE ROOSEVELT.

Newfoundland Caribou (*Tarandus rangifer terræ-novæ*).

Measurements.—Height, 45 to 50 inches at shoulder; length, 76 inches; weight, 280 to 400 lb.

Horns.—The greatest recorded length of horn is 48½ inches; greatest number of points, 49. Antlers are locally judged by number of points. A 30-pointer is considered a warrantable stag, while perhaps a proportion of 1 in every 80 to 100 stags may carry 40 points or over. Many of the does carry horns, which they do not drop until April or May.

Migratory Habits.—Until recent years the belief was generally held that all, or practically all, the caribou of Newfoundland migrated in the spring from the south and central districts of the island to the Northern Peninsula, returning in September and October to their winter quarters. At that time an enormous proportion of the caribou killed in Newfoundland were shot on their migration while crossing the line of railway near Howley Station. During the period that this annual battue lasted, the sportsmen camped about the station, and it often happened that when one individual took up his position on a likely "lead" or natural avenue to wait for the migratory deer, he met with no success, owing to the fact that another man with a rifle was ensconced unseen in the same lead some distance above him. Although Howley is still visited by numbers of shooters, the tendency of the hunters is to follow the example, set by Mr. F. C. Selous, of going to look for the caribou instead of waiting for the caribou to come and look for them. One result of these observations made further afield is that it is now conclusively proved that vast numbers of caribou do not any longer cross the railway, but spend the whole year in the woods and upon the barrens of the interior. It is probable that deer moving in this way travel over much the same ground every year. This is borne out by the fact that the writer identified a stag recognisable by a single malformed horn two consecutive seasons about the same spot. The caribou of Newfoundland may be roughly divided into three divisions, the first two of which intermingle during migration. The best known is that already alluded to as crossing the line of railway in its migration; the second herd inhabits the vast interior south of the railway, and appears to migrate between the railway line to the north and the south coast, and is the one hunted by the Micmac Indians; the third is a small body of deer, the survivals of a herd that once occupied the Avalon peninsula south of St. John's, and these do not migrate at all.

STAG SWIMMING ACROSS A LAKE.

Game Laws.—There are two seasons, divided by a close time of three weeks, during which caribou may be hunted. The first lasts from August 1st to September 30th inclusive; the second begins on October 21st, but as the deer drop their horns in the beginning of November, only the early part of this season is of value to the sportsman in search of trophies. During the September season (the horns are not clear of velvet until the first days of that month) the stags keep much in the shelter of the thick woods, only emerging at dawn or dusk or by chance. At this time the hunter must be prepared for a good deal of watching by lakes and sandy reaches and at certain marshes, and the number of stags seen is sure to be comparatively few; but, on the other hand, the caribou is unquestionably a more difficult beast to secure in September than later in the year, when, if the hunter hits upon the migration, he will naturally see many more animals, and also find them in more open ground. The rutting season commences in the last days of September, and continues throughout October. During this time the stag-meat is almost uneatable, so that except for their horns the animals killed in the second season are often wasted.

The licence to shoot caribou, which costs $50, permits the hunter to shoot three stags only. The number has recently been reduced, as under the old licence law five stags and two does made the limit. Residents of the island may kill five caribou annually, but as long as a Newfoundlander is acting as guide to a non-resident, he is, very wisely, prohibited from exercising his right. All guides must be certificated, and non-resident guides must take out a licence for the season costing $50.

The greater part of the interior of the island in the neighbourhood of Middle Ridge is divided into hunting-grounds by the Micmac Indians, a branch of the Nova Scotian tribe who transferred themselves from the mainland about the middle of the eighteenth century. They do not resent the killing of caribou on their grounds, but if trappers worked over the same districts, they might resent the invasion.

H. HESKETH PRICHARD.

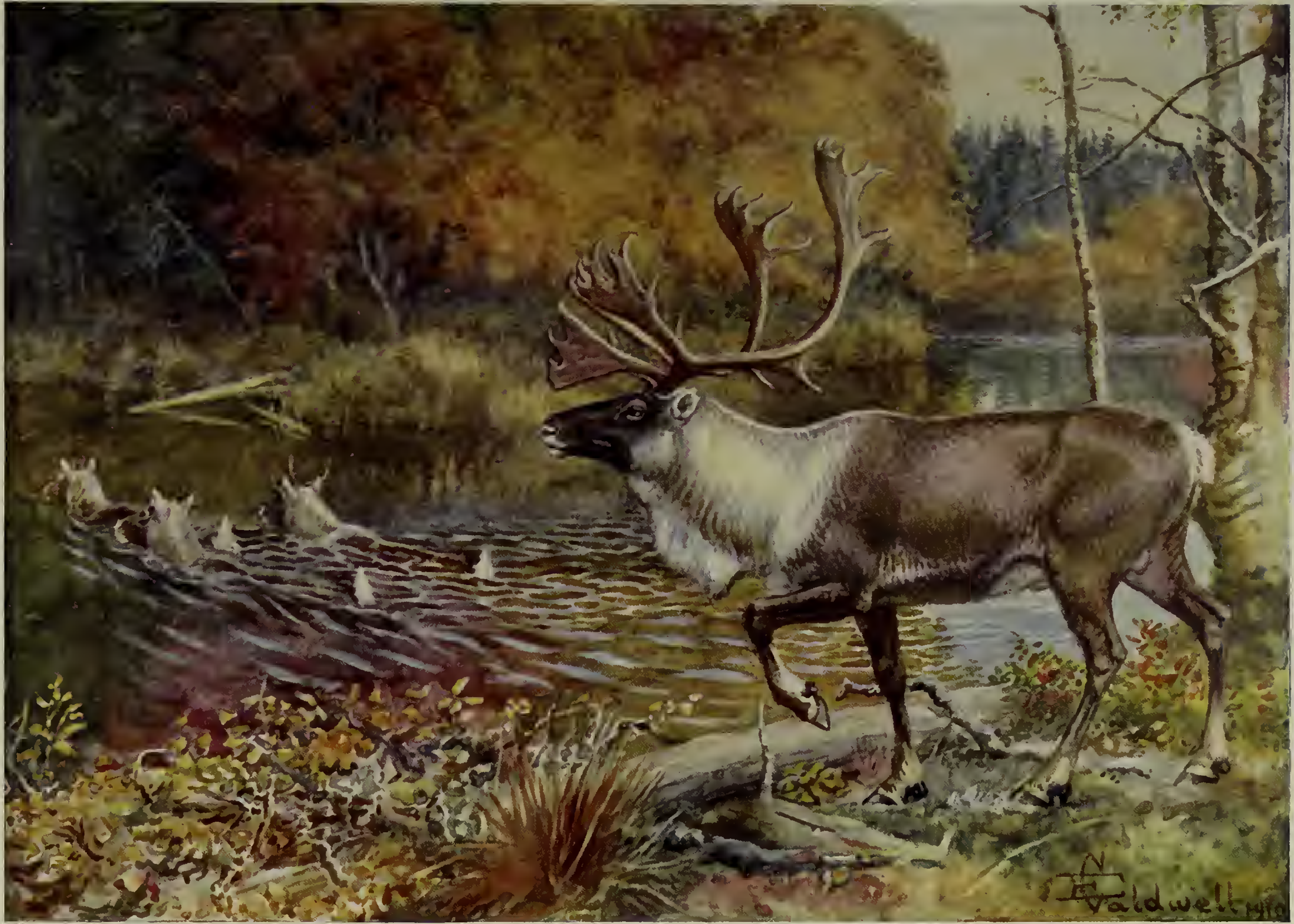
CARP (*Cyprinus carpio*). — [*See* ANGLING (COARSE FISH.)]

MEASUREMENTS, &c.—Length of head 4 to 4⅔, of caudal fin 5¾ to 6, height of body 3 to 4½ in the total length. *Eyes*—small, situated a little before the middle of the length of the head, 2½ diameters from the end of the snout, and 3 apart (in an example nearly 17 in. long). Opercle strongly striated. The proportions of the various parts of the fish are exceedingly diverse, dependent upon age, sex, and locality. *Barbels*—of moderate length, those at the maxilla the longest, and almost equalling one diameter of the orbit. Lips thick and leathery. The maxilla reaches to beneath the front edge of the orbit. *Fins*—dorsal commences rather nearer to the snout than to the base of the caudal, its first two or three, or rarely four, rays are bony, the last being serrated posteriorly, while the anterior portion of the fin, which is the highest, equals about two-fifths of the height of the body below it. Pectoral situated low down; its length equals about that of the head without the snout, and it does not extend to above the ventral, which latter reaches half-way to the anal. First two or three anal rays osseous, the last being serrated posteriorly. Caudal deeply forked. *Scales*—large, 5½ to 6 rows between the lateral line and the base of the ventral fin. *Colours*—vary, usually brownish or with a bluish tinge along the back, with golden or coppery reflections along the sides. Some have been described of a whitish tint, due, perhaps, to age, others as having black spots caused, perhaps occasionally, by parasites. Day, *Fishes of Great Britain and Ireland*, vol. ii., p. 158.

CARP.

CATAPULT SHOOTING.—Ever since the Romans used it as their great engine of war, a series of weapons of great accuracy and greater shock have gradually ousted the catapult from its first stage of importance, until it has degenerated to the mere plaything of schoolboys.

In the big schools of England, France, Germany, and America, the catapult is still



From an original painting by E. Calawell.

CARIBOU.

as popular as it was with our grandfathers. For the most part, a coarse inaccurate weapon, used in hurling small stones, and combining economy and inaccuracy, is in favour.

In a large public school, probably twenty per cent. of the boys have at one time or another used catapults; and though probably only two or three ever really master the science, yet the little weapon is, when properly made and used, and taking into consideration the rough materials of its construction, capable of a wonderful degree of accuracy.

If the history of many of the very best sportsmen and shots could be written, it would be found that the foundations of their skill with gun and rifle were laid in early days by the use of this insignificant weapon. To youths who have not yet attained to the use of large weapons, there is no finer training for judging distances on a small scale than shooting with the "tweeker," the small catapult to which I shall presently allude. Every shot fired can be seen by the shooter to the top of its parabolic curve, and even when it has begun to drop.

What, it may be asked, has the catapult got to do with the sportsman who has arrived at years of maturity? And of what practical use is it? None, certainly, to anyone who only *begins* to shoot with it in days when the muscles of the arm have become rigid, for there is a certain knack about its use not to be acquired in after years. But to the big-game shooter who may find himself in some out-of-the-way corner of the earth, such as Western America, Newfoundland, Iceland, Spitzbergen, and other places, where the various species of grouse and ptarmigan are plentiful and *tame*, it is of every use. There is not a big-game hunter in search of large animals, who has not, at some time and in such a country, been confronted with the difficulty of supplying his pot with fresh meat without having to bang off his gun or rifle at the risk of disturbing the whole neighbourhood and his particular quarry. A man who knows how to use a catapult, even though he may not be a first-class shot with it, will find the little weapon of immense help under such circumstances. The various species of grouse, particularly the blue Rocky Mountain grouse (*Dendragapus obscurus*), will, with care, readily allow a man to approach to within eight or ten yards, a distance at which, after a few shots, the catapulter ought easily to be able to strike a blow effectively in either the head or neck. It is not difficult to avoid striking the bird in the body, as the necessary elevation can quickly be obtained against the clear sky. Every shot can be seen, and the shooting is practically noiseless, so that it does not disturb the birds, who only raise their heads and look about, even when a pellet may have touched the feathers in their neck. During a trip to the Rocky Mountains in 1886, I found the blue grouse very plentiful in the Big Horn Mountains, and could generally manage to supply the pot for the day when bigger game was scarce. For this purpose I used elastic about $\frac{1}{8}$ inch in thickness, which is nearly double that of "tweeker" calibre, and gives a greater shock without perhaps the same degree of accuracy.

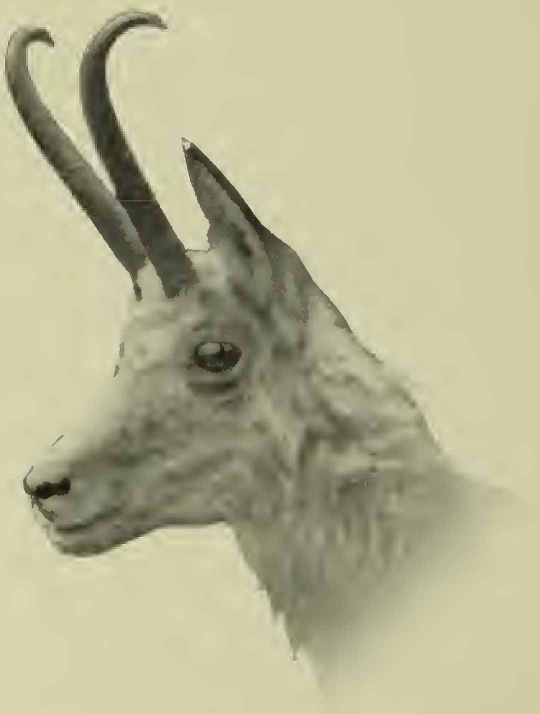
Materials.—Catapults are like rifles in one respect: the thinner the elastic, or the smaller the bore, as one would say, the greater the accuracy. But then, again, range is curtailed by too thin an elastic. Although not giving sufficient shock to kill outright so large a bird as a grouse, the best elastic for all-round use, combining accuracy and shock, is $\frac{1}{16}$ inch thick, and used in lengths of 9 inches, with a single No. 1 shot, dog-skin pouch, and fork of privet, which should be peeled, dried, and hardened in the smoke of a candle. With such a weapon properly made, it is not difficult for an expert to put ten pellets in a three inch circle at ten yards. Nearly the whole art of shooting properly with so delicate a weapon is to get the force required. This can only be done by the shooter finding out for himself exactly how to give the pull back of the left hand, holding the shot in the pouch, and letting go as the *right* hand gives the forward jerk to the fork. But no man can be taught to shoot with a catapult, or any other weapon, by means of a book, though certain hints may be of use, and accuracy is obtained only by constant practice.

The elastic should never be used cold as it is bought. The best plan is to carry it in the breeches pocket two days before using, or steam it for an hour or two in hot water to make it soft and pliable. The writer knows of one boy who was so devoted to his sport that he always carried a strand or two of the elastic in his mouth, ready for immediate use.

J. G. MILLAIS.

CHAMOIS (*Rupicapra tragus*).—Chamois stalking is with the Austrians what fox-hunting is in England. It is the favourite sport of the Austrian Kaiser, and of all who can indulge in it. But the number who follow the Alpine goat is small compared to the number who follow the stag, partly on account of the expense incurred, and partly on account of the dangerous and fatiguing nature of the work. The first question the huntsman asks the stranger is whether he is *schwindlig* (giddy). If the latter can fearlessly answer in the negative, and proves on his first essay that he is possessed of the necessary nerve in negotiating dangerous places, the *Jäger* is satisfied and—beyond giving a hand in places where only a son of the Alps could manage to progress at all—will confine his attention to the game.

The chamois is hunted by the *Birsch* method, or stalked, both in summer and winter. In the warm weather he keeps to the highest summits of the Alps, but the deep snow brings him down almost to the valleys in search of food, and those who can stand the cold and the fatigue prefer to stalk him in winter. When the snow is very deep, however, stalking is out of the question, and one is reduced to driving.


[*Photo. by W. S. Berridge, F.Z.S.*

CHAMOIS.

Habits.—He is a very peculiar animal in his movements. The stag will hurry from place to place, only stopping to feed, and thus traverse miles in a day and night; but the chamois will often remain feeding for days together in an area as confined as that of an ordinary dwelling-house. Yet it must not be supposed that he remains quiescent. On the contrary, he is never still for a minute together, but is continually imbued with an unconquerable restlessness that prompts him to take little quick jumps between almost every nibble at the herbage. He is ever on the alert for a foe, and this wariness makes stalking very difficult. His scent is keener than that of the stag, which again enhances the difficulty. In the deepest snow, with a wild wind raging, the chamois will spring unhesitatingly at the face of an apparently perpendicular wall of rock. He makes for the patches of snow visible on the face of the rock, for either instinct or experience has taught him that where there is room for snow to catch he can find footing.

Local Knowledge, &c.—There is no sport that requires such perfect and unerring local knowledge as chamois stalking. In many places during one day a sportsman's life is absolutely in the hands of the *Jäger* who conducts him. The *Jäger* must know every inch of the track, for one false step may mean almost instantaneous death. Consequently, only picked men of undoubted local knowledge are chosen, generally those who have served a long apprenticeship as beaters or drivers. I may here mention, as it is not generally known, that the *Jäger* is a servant of the State, for, although paid privately by the gentleman who employs him, he is bound to pass a qualifying examination, and take an oath, before his licence is granted him. Moreover, there are regiments recruited from the ranks of these *Jäger*, similar to the *Chasseurs* of France.

Buck and "Geiss."—One of the principal difficulties in chamois shooting is to distinguish between the buck and the *Geiss*, or female. The general contour of their forms is alike; they are much the same size, and the horns are very similar in male and female. The only, or at least the main, difference is that in the buck the horns are wider apart at the tips and thicker at the base than in the female. In the *Jägersprache*, or hunting slang, which is very elaborate in that country, the word *Geiss* has come to be applied only to a female without young, although it really only means "goat."

Clothing.—The sportsmen and *Jäger* wear short breeches made of the skin of the chamois, preferable to cloth or leather, for the former gets wet and the latter is generally too stiff to be manageable. The *Jäger's* dress is very quaint, but very practical, which is everything. The breeches, as just mentioned, are of chamois skin, barely reaching to the knee, in order to leave the leg free for climbing, and prettily decorated with designs worked in thread of emerald green. In summer bright green stockings are worn, not quite as high as the knee; but in winter many pairs of long thick stockings are worn right up to the thigh. The coat is of dark green cloth, with many pockets, and buttons of horn. The more pockets one has when chamois stalking, and the more one manages to get into them, the better one is satisfied. Thick, heavily-shod mountain boots, and a hat decorated with trophies of the chase, generally the feathers of the capercailzie, or a chamois "beard," complete the costume.

This chamois "beard," as it is called, is *the* trophy of the chamois chase. The name is given to the hair which grows along the spine, and which is exceedingly long and handsome. In winter it is a rich dark brown colour, tipped with silver-grey points, but in summer it turns to a greyish tint. The huntsmen pull it out most carefully, and arrange it in the shape of a plume, binding the root ends very firmly together with a green thread. This plume is worn in the hat, generally fixed with a silver brooch stamped with the figure of a chamois. The task of picking, arranging, and binding the hairs is a slow and tedious one, and makes these trophies very valuable. Between three and four pounds sterling, or their equivalent, are given for a fair trophy of this description, and considerably more if the specimen be a really fine one. In addition to this trophy, the *Jäger* generally extracts the two front teeth, and these are worn in scarf-pins. It is no uncommon sight to see a *Jäger,* or even a peasant landholder, wearing as trophies all that remains of several stags, chamois, and *Auerhahn,* or capercailzie.

On account of the glaciers to be crossed, slippery rocks to be traversed, and similar obstacles, the huntsman must have his feet shod with climbing irons, bound firmly to the foot with stout leathern thongs, and furnished with sharp spikes to grip the ice or rock. He also carries a *Bergstock,* or mountain stick, a long pole with a spike at the end, which is really and truly as necessary in some places as the man's own legs.

[*Copyright by Underwood and Underwood.*

A Chamois in its Natural Haunts.

Chamois Ground.—To show that the chamois requires some room, I may mention that my chamois ground, by no means a very large one, covers an area equal to fifty English square miles. A little lumbering is done on the ground, and some of it is given over to peasant holdings, but the bulk of it is virgin Alp land, roamed over by the chamois, my *Jäger,* and poachers.

Poachers.—These are very numerous, and form a powerfully antagonistic element to sport. Poaching as they do from sport and not from want, they are very hard to deal with, and as it is an easy matter for them to find out in what part of the country you will be shooting at a certain time, it is no uncommon thing for them to be enjoying themselves simultaneously at a conveniently remote distance. They do not even stop at human bloodshed when pursuing their illegal sport, but will open fire on the *Jäger* if molested, and many are the reports that come in from the more remote and lawless districts of *Jäger* being tortured or murdered whilst endeavouring to do their duty. On one of the last occasions that I was out stalking, we heard rifle shots not very far from our position, in consequence of which my *Jäger* had to leave me and go and prospect. He was away that day and night, returning next day at noon, but could discover nothing.

Dangers of the Sport.—One of the greatest dangers encountered in chamois stalking arises from the frequency and suddenness of the *Lavine,* or whirlwind, accompanied generally by an avalanche of snow, which will come upon the huntsman suddenly and without warning in deep gorges of the Alps, roaring down the mountain side with terrific force, or catching him as he breasts some steep bluff. Such is the force of the wind, accompanied by blinding snow, that the sportsmen are often in danger of being whirled bodily away by the strength of it, and from generations of experience and sad fatalities have learnt to throw themselves face downwards on the ground when it is heard approaching.

A Day's Sport.—To give an idea of what a day's chamois stalking means, I will briefly describe a day on one of my last outings.

We rose hours before the dawn on a December morning, with a world of snow around us such as is only seen in Alpine and Northern lands. Breakfast was the first consideration, and full justice we did to the meal. The very prospect of going through a fatiguing day's work in such cold induces one to eat, if only from motives of physical economy. Then, the *Jäger* having bound on our irons, and our *Rucksacks* loaded, we put on our strong leathern gauntlets, and, climbing pole in hand, followed our *Jäger* bearing the rifle slung at his back, and carrying a collapsible lantern to light the way till such time as it should brighten. The snow was half-way up our thighs even in the valley (if the gorge round our hut, three or four hours' march from the nearest hamlet, and high up among a chain of Alps, can be called a valley), and we speculated curiously as to what it would be like higher up. Meanwhile, all we had to do was to tread in the *Jäger's* capacious footsteps, and take care not to slip or fall into some unseen cavity. Four hours' stiff climbing, during which our clothes were saturated with perspiration, brought us to a point that we could easily reach in one hour in summer. The lantern had long been extinguished and packed away, and a cold white glare hung over the peaks. We were now half-way up one side of a vast gorge, scalloped out of the mountains by centuries of recurring winter snows and spring floods. On a perilous-looking bluff on the opposite slope, just below the line of the eternal snow, is a substantial hut of pine logs, reared by an adventurous Englishman who had come prospecting in the rugged gorges around for precious stones, and, what is more, had found them.

The *Jäger* drew his long *Hirschfänger* ("stag-catcher") and proceeded to chop off some pine boughs with it for me to sit on. This knife is very powerful, with a heavy horn handle, and is carried bayonet-wise in a belt around the waist. It is used for despatching the game, gralloching, and pioneering through the undergrowth. He removed my climbing irons, produced from the depths of his haversack my felt overboots, and made my lower man comfortable. My air cushion was inflated, and having donned my thick fur coat, I sat and enjoyed a second breakfast, with the strongest of schnapps, a brand called *Slivovitz,* introduced from Turkey. It is really astonishing how much coarse fat and raw spirits a man can consume when chamois stalking.

Breakfast was nearly over when we sighted a herd of chamois at some considerable distance. I raked them with my glasses, and could make out several fine bucks, jumping every few seconds, as they fed, in their jerky, nervous manner. We packed up and started stalking, but it was no good. We could not get anywhere near them. Later on we sighted a solitary old buck with a fine pair of horns on the wrong side of a rather dangerous glacier. To reach it we must scale flight after flight of *escaliers* built of rough pine logs, and clamped to the face of the rock with iron. It is a beautiful but a terrible pathway. One looks down seemingly miles to the gorge below, and speculates on the results of a false step. In the crevices the Edelweiss blooms gaily, raising its little white star in emulation of the white around. We crossed the glacier, bending nearly double, feeling our way inch by inch, and taking care to get a good grip with our irons before making a single step. The chamois was feeding in a patch of cover near the farther edge. The wind suddenly changed, veering towards him. He became suspicious instantly, although he could see nothing, and came down towards us. While he paused after a run, as is the custom of the animal, I took aim, although he was nearly four hundred paces away, for I knew my only chance had come, as the path he was striking would take him further from me. Simultaneously with the report, and to my intense chagrin and mortification, he went down the slope, skirting the glacier as fast as he could.

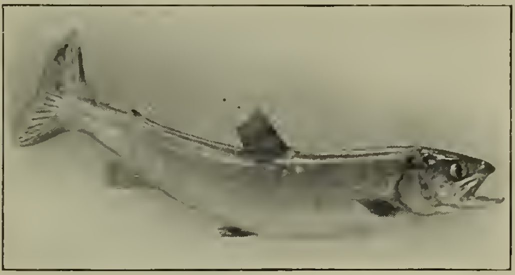
We ascended the gorge above the glacier with dampened spirits, when suddenly around a bend came a herd of some fifteen or sixteen, bucking along in a straggling line. I fell upon my knees and waited. Fortunately the wind held good, and they came within range all unsuspecting. I singled out, as I thought, two fine bucks, and fired, succeeding in dropping both. The rest turned, sprang at the rocks and disappeared. On investigation one turned out to be a good buck, the other a very well-developed *Geiss;* but we were not undeceived regarding the latter till we had it in the skinning-house.

To show what skill a veteran *Jäger* can acquire, I may mention that on one occasion his Majesty the Emperor of Austria shot twenty-seven chamois in one day, of which *nineteen* were bucks. To anybody who can appreciate the difficulty of distinction, this constitutes a record. To the late Count Meran, son of the Archduke John, belonged the honour of having dropped two thousand.

In conclusion, I can thoroughly recommend chamois stalking as a sport that brings out all the true qualities of a sportsman, and to any of my readers who may chance to embark on it I wish most heartily *Waidmannsheil!*

Schlick.

CHAR (from the Gaelic *ceara*—red or blood-coloured), *Salmo alpinus, S. salvelinus, S. willughbii, S. cambricus,* Welsh *torgoch.* This, the rarest of our non-migratory Salmonidæ, has been very much subdivided by naturalists without sufficient cause. The char which inhabit various waters in England and Wales, Ireland, and Scotland are all of the same species, slightly altered by the different surroundings under which each has lived. Those from Windermere and Coniston (Westmorland and Lancashire) are without doubt the finest in the British Isles, not only in size, but in flavour. When transferred from these larger lakes to smaller sheets of water, such as Hawes Water and Goats Water, the char have changed in outward appearance very much. In these latter places they fail to find the same food, larvæ, water beetles, &c., upon which they thrive in what may be called the parent waters; they therefore degenerate in size, and rise more or less freely to the fly, both natural and artificial. In such places it is to the char of Windermere just about what the brown and yellow tiny burn trout is to the lusty trout of larger rivers and lakes. Notwithstanding what has been said to the contrary and its nomenclature, "*alpinus,*" it is indigenous to this country, and there is no proof of its naturalisation with us. As a sporting fish it does not rank high, rising most freely to the fly in the smaller lakes. In those of Cumberland, Westmorland, and Lancashire, where it is found in greatest abundance, it is mostly taken by nets, which are drawn in deep waters on to the shallows. It is also commonly caught by means of "plumb lines," which were invented in order that the artificial baits—spoons or pieces of metal, bright on one side, coloured on the other, cut out in the shape of a fish—used on them, might be spun steadily at varying depths. Two lines are used from each boat, one on each side, and each line has from four to six baits on it. To keep them down, a sinker of about 1½ lb. weight is used, so adjusted that it will not spin round and entangle the line. Each line is fastened to a somewhat stiff rod of about ten or eleven feet long, which is fixed upright in the boat, and to which a bell is attached. When a bait is struck the "tinkle-tinkle" warns the fisherman, who is slowly plying his oars, of the fact. In the English lakes char are seldom nowadays taken with fly or worm. In Llanberis Lake they have occasionally been taken in large quantities with the worm at night. In the Irish lakes, Loughs Conn and Inagh to wit, char are occasionally taken with fly when trout fishing. They used to be so taken on Ulleswater (West-



Char.

morland), on Loch Leven, and on Lough Neagh, but from all these places they appear to have disappeared, no doubt exterminated by pike, by destruction during spawning time, and by pollutions. Char vary in weight from six to the pound to a pound and a half each, although fish over 2 lb. have occasionally been caught in this country. An ordinary trout fly, rather bright in colour, will take it best, but the char is an uncertain riser. Some time ago a gentleman was trout fishing in Loch Lubnaig, in Perthshire, and saw a number of fish rising in a curious way close to the bank. He threw over them, and in a short time caught, mostly with a teal and red body, a dozen fish, which he failed to recognise. They were char, and the natives had not known one taken with fly for many years previously. In Lapland and Norway the char grows to a larger size than with us, 2 lb. and 3 lb. fish not being rare, and they take fly freely. It is also more or less plentiful in European rivers and most of the European lakes, especially such as are situate at a high altitude. It is found in America and in Canada.

The char spawns at the same periods as trout, sometimes on the shores of the lakes, sometimes in the adjoining streams. It comes under the same law as trout as to close season. Where a licence is required its cost is usually 2*s*. 6*d*.; the charge for a "plumb line" licence is 5*s*. The char may not be taken in Windermere and Coniston between October 2nd and March 31st. In Scotland there is no close time. In Ireland it is from November 1st to January 31st. During the season char is considered a great dainty, and "potted char" is one of the luxuries to be obtained at the English Lakes. The char, owing to its delicacy, is not a useful fish for the pisciculturist, and seldom becomes thoroughly acclimatised in waters where it has been artificially introduced.

R. B. Lee.

Measurements, &c.—Length of head 4¾ to 5¼, of caudal fin 6 to 6½, height of body 4½ to 5½ in total length. *Eyes*—size depends much upon age, sex, and locality from whence procured: usually situated just in front of the middle of the length of the head, from 1¼ to 2 diameters from the end of the snout and the same distance apart. In some the comparative height of the body is much greater than in others, and dependent on food, health, and the breeding season, the kelts becoming emaciated. The maxilla in some extends to beneath the last third of the orbit, in others to beyond the vertical from its hind margin, while it is likewise slightly more strongly developed in some than in others. The lower jaw in some varieties, as in the torgoch of Wales, may be longer anteriorly than the upper jaw. The opercular pieces are of as diverse shape in the char as the trout, and frequently are dissimilar in the opposite sides of the head. *Teeth*—present in the jaws and in a line across the vomer near its anterior extremity, and opposite the teeth of the palatine arch, none along the body of the vomer. *Fins*—dorsal usually commences about midway between the end of the snout and the base of the caudal fin, in some examples a little nearer the snout. The pectoral and other fins are of varying lengths according to locality, sex, and other varying conditions. *Scales*—small, and a much larger number of rows descending from the back of the lateral-line than there are of pierced rows along its whole extent. *Coecal appendages*—these vary considerably, in Loch Inch 38 (Thompson): L. Rannoch 28: the Lakes 28 to 44, Dr. Gunther detected from 36 to 52, and the smallest number in those from Windermere, 36. From the same locality I possess an example with 28. They are as inconsistent as in the trout.

Colours.—These again vary, but as a general rule the belly, prior to spawning, becomes of a crimson or claret colour, while there are generally some light-coloured orange or black spots on the body and head. The front edge of the dorsal, ventral, and caudal, as well as the upper edge of the pectoral, are often of a pure white or orange colour. The variation in tints and shades is not so great as in the trout. In some, the ventral, anal, lower portion of the pectoral, and hind edge of the caudal partake of the scarlet colour of the abdomen.—Day's *Fishes of Great Britain and Ireland*, vol. ii., p. 114.

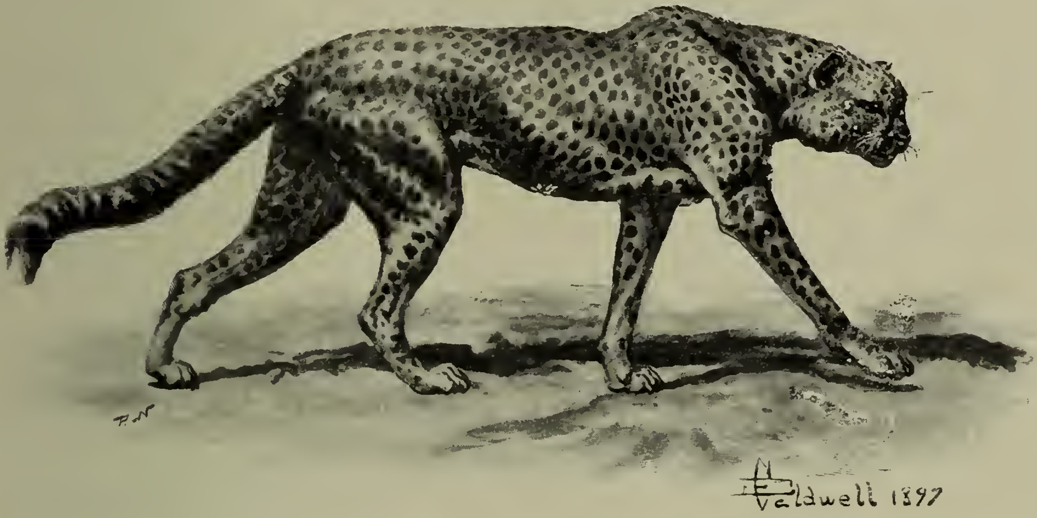
CHEETA (*Cynælurus jubatus*, Hindustani, *Chita*).—The Cheeta, or Hunting Leopard, is a member of the great Cat-family (Felidæ), allied to the common Leopard, but differing from it in so many essential points that it is now regarded as generically distinct. It stands higher on its legs than an ordinary Leopard, and has relatively a more slender body and a longer tail; ears short and rounded; the face shorter and the crown more elevated than in the Leopard. The upper flesh-tooth is without the cusp on the inner side which is characteristic of the true cats, while the claws are shorter and only partially retractile.

The length of an adult Cheeta is about

7 ft., including the tail, which measures about 2½ ft. The height at the shoulder will vary from 2 ft. 5 in. to 2 ft. 7 in.

The Cheeta occurs throughout Africa and South-Western Asia from Persia to the countries east of the Caspian, but not further east than India, where it is most common in Jeypur and Hyderabad. It has not been met with north of the Ganges nor in Ceylon. Its usual haunts are the low rocky hills bordering the plains on which are found the Antelopes which form its chief prey, although, like the Caracal or Desert Lynx, it will likewise capture hares and game birds.

The employment of this animal for the chase seems to have been known in the East from a very early period. It is figured on Assyrian bas-reliefs in the act of seizing an Antelope, and is represented also on Egyptian monuments about 1700 B.C. Amongst the animals brought in by way of tribute to the Kings of Thebes by the black tribes of the Upper Nile is a Cheeta led in a slip with a very ornamental collar.



CHEETA.

Average height at shoulder, 2 ft. 7 in. Average length from head to root of tail, 4 ft. 6 in.

We learn from Baron de Noirmont (*Histoire de la Chasse*) that both Charles VIII. and Louis XII. of France kept trained animals of this kind, with which they killed hares and roedeer. After a kill, the Cheeta, on being shown a little blood in a tin bowl, would leave its prey and jump on the horse's crupper behind its master. One would imagine that the horse would require as much training as the Cheeta to stand quiet in such very trying circumstances. Frances I., who ascended the throne of France in 1515, also had his Hunting Leopards which, according to Gesner (*Hist. Anim.*), were of two kinds. From his description the smaller kind must have been a Lynx. They must have been very docile, for, he says, the keeper scarcely mounted his horse before the beast jumped up after him, and seated itself on a cushion behind the saddle. Henri II., the successor of Frances I., in 1547 continued this kind of sport, and it appears to have been patronised at the French Court until the days of Henry IV., when the last trained Leopards seen in France were those brought by Marie de Medici from Florence in 1601. After that date, says Baron de Noirmont, they were no longer to be seen either in France or Italy, although in Germany the sport was revived by Leopold I., who died in 1705.

There is no record of the successful use of the Hunting Leopard in England. Even James I., great sportsman as he was, drew the line there. But an experiment was once made in this direction by the Duke of Cumberland, brother of George IV., with one of two Cheetas belonging to Tippoo Sahib, which were brought to Windsor in 1799. The Duke made a large enclosure in the park with strong netting 15 ft. high, into which he turned a stag from Windsor forest. The Cheeta was then brought in by two Indian attendants and unhooded. The stag showed fight, lowering his horns; and the Cheeta, disliking the look of his opponent, bounded over the nets, and, dashing through the terrified crowd of spectators, pursued and killed a fallow deer at no great distance; and so ended what was probably the first and last attempt at hunting with the Cheeta in this country.

The sport as practised in India at the present day is conducted somewhat as follows:—The Cheeta, hooded like a falcon, and held by a stout collar and cord, is carried to the field on a bullock cart, on which he sits side by side with the native keeper who has charge of him, and who pats and caresses him from time to time. The cart proceeds across country, until deer or antelope are seen. The driver then advances circuitously, gradually narrowing his circle until he gets within one or two hundred yards of the nearest antelope, which, accustomed to see the native carts of the country, does not at first take much notice of that which carries the Cheeta. As soon as he is near enough, the driver stops, and the keeper removes the hood of the Cheeta, which springs lightly from the cart, and commences his stalk, availing himself of every bush and hillock between himself and his prey as he stealthily approaches it. When within forty or fifty yards he jumps up, and in a series of magnificent bounds dashes at the nearest antelope, and generally brings it down, fastening at once upon its throat and killing it. It sometimes happens, however, that the intended victim gets too good a start, and the Cheeta, failing to overtake it within a reasonable distance, gives up the chase and returns sulkily to his keeper, who feeds and rehoods him. In the event of a kill, the keeper runs up with a tin bowl, and, cutting the deer's throat, fills the bowl with the blood, which he allows the Cheeta to lap up, until, watching a favourable opportunity, he slips on the hood, and leads the animal back to the cart. The sportsmen who go out on these occasions are either mounted on horseback, or go in pairs, in bullock carts like that which carries the Cheeta.

J. E. Harting.

CHEETA, AFRICAN.—The African Cheeta (*Felis jubata*), Leñau of the Bechuanas, Luipaard of the Boers, is a shy, nocturnal beast, which seldom falls to the rifle of the white sportsman. It figures very rarely indeed in the records of English hunters in South Africa. Many Europeans spend years in the country without setting eyes on this animal. Yet, from the Cape Colony northwards, the Cheeta is not an altogether uncommon beast of prey. In Bechuanaland the natives snare annually a considerable number of these animals, and hunt them with dogs. Karosses or rugs made from the handsome skins of the Leñau are well known at the up-country stores, where they are taken in barter. The Cheeta is nothing like so dangerous a beast to tackle as the leopard, and is killed even by the natives with their knob-kerries, or club-sticks. The African Cheeta much resembles its Asiatic congener. It stands high upon the leg, and has the dog-like foot and non-retractile claws, which distinguish it at once from the true leopard. Its high skull, somewhat woolly fur, a slight mane, and the differences in marking, which may at once be noted on comparing its skin with that of the leopard, serve further to accentuate the dissimilarity between the two animals.

It feeds on the smaller antelopes, hares, game birds, and occasionally sheep and goats, and is extremely devoted to the springbuck, of which it kills a good many. A peculiar local variety of Cheeta (*Felis lanea*), known to naturalists as the Woolly Cheeta, has been found in the Karroo district of Cape Colony, in the neighbourhood of Beaufort West. In this variety—an example of which was formerly exhibited in the Zoological Gardens—the fur is extremely dense, and the markings are tawny instead of black.

H. A. Bryden.

CHEETAL or **CHEETUL** (*Cervus axis*).—This deer is commonly known as the Spotted Deer of India. It much resembles the Fallow Deer of Europe, except as regards its horns, which are never palmated like those of the Fallow. Its colour, too, a light reddish-brown, is darker, and the white spots along its back and sides are more distinctly defined. The stag has three distinct points on each gracefully curved horn, often with one or two short snags just above the brow antler. The ordinary length of horn is about 30 inches, and the circumference of beam about 3½ inches, but the writer has shot a Cheetul with horns over 36 inches, and as they were in velvet and their points quite soft, they would probably have grown an inch or two longer. The span within the bend was 30 inches, but such width is exceptional. In height the Cheetul stands from about 30 to 34 inches, its size varying in different localities.

Habitat.—It is usually abundant in large tracts of dense forest, interspersed with glades of high grass, where water is fairly plentiful (such as the Terai, for instance), or on the extremities of the forest-clad spurs of the Himalayas, which run down into that tract. It is very common in the Dehra Dún Valley, and on the Sewalik range of low-wooded hills which flank it on the west. In fact, it is more or less common in almost all the level or lowhilled jungles it affects, from the foot of the Himalayas to Cape Comorin, and even to Ceylon, but never where deep shade, long grass, and water are absent.

Characteristics.—In habits the Cheetul is timid and shy, and it seldom, if ever, attempts to show fight, even if approached when wounded. Yet it may frequently be found quite close to small hamlets where patches of ground in heavy jungles have been cleared for cultivation, especially when the cereals are young and green. Its cry of alarm, a short high-pitched sort of bark, is more often heard at night when the animal is alarmed by some prowling beast of prey. Where its haunts are in more or less level localities it is almost invariably shot from elephant back, but the most sportsmanlike way of hunting it is, where possible, to follow it on foot in broken or low-hilly ground.

CHEETUL.

Height at shoulder, 32 in. Av. horn meas. 30 in.; max. horn meas. 38¾ in.

Cheetul sometimes congregate in large numbers, but they are mostly found in herds of from five or six to a dozen or more, and usually with a good stag or two in a herd.

A singular characteristic of this deer is the irregularity with which it sheds its horns. The writer has hunted Cheetul at many different times of year and found them with horns in every stage of growth. But the best time for hunting them is from December to March, when the jungles are more free from malaria and the heat is not too oppressive. Moreover, some of their favourite resorts are now strictly closed from April to October by the Government Forest Department.

Armament.—A double Express rifle of from ·450 to ·500 bore, carrying a projectile of *soft* lead about an inch long, hollowed to not more than half its length, the hollow plugged with a bit of wood, is about the most suitable implement for Cheetul-shooting. The cartridge should be loaded with the strongest charge of powder the rifle can stand. Many a wounded wild animal is lost in dense jungle from want of smashing power and a flat trajectory in the weapon used for shooting at it.

DONALD MACINTYRE.

CHICKARA.—The **Chickara, Chinkara, Ravine Deer,** or **Indian Gazelle** (*G. bennettii*), is found throughout the plains of India, with the exception of some parts of Lower Bengal and the Malabar District, and while preferring low rocky hills intersected by ravines, and clothed with scrub jungle, or tracts of the medium forest type containing glades, or open savannahs suitable for grazing, it is also numerous on some of the large plains of Southern and Central India, and on the confines of the sandy deserts of Rajputana and Scinde.

The buck is about 28 inches in height; colour above, deep fawn, white on the sides, buttocks, and lower parts generally; tail 8 inches long and black in colour; horns 10 to 13 inches according to locality. They occur in herds of from six to twenty individuals, but solitary bucks are not uncommon. Whether standing or moving, they have a habit of wagging their tails vigorously, the movement often betraying their presence, when they would otherwise escape notice. Being small and active, they are difficult to hit; the vital spot, moreover, is but a few square inches in size, and for this reason I preferred a small Express rifle fitted with telescopic sights, which facilitated accuracy of aim up to 180 yards, whereas with the ordinary bead-foresight the body would be greatly obscured at half that distance. The Chickara can exist for more than two days without water, being in this respect only equalled by the Nilgai.

On the verge of the Bikaneer desert the country is sandy, flat, and devoid of cover, and although both Blackbuck and Chickara are abundant, they are almost unapproachable.

In the month of February, small patches

of *Chenna* (pulse) are dotted here and there, near which one may sight an occasional herd, numbering some fifteen or twenty animals. Dismounting from his camel, and keeping close to it, the sportsman should direct the driver to shape his course so as to pass diagonally ahead of the herd, on the chance of their massing, as is their custom, and giving a broadside shot at a good buck. On gaining any suitable cover, the sportsman halts out of sight of the herd, directing the camel-man to move on, circling gradually.

[*Photo. by W. S. Berridge, F.Z.S.*

CHICKARA

I recollect on one occasion getting in this way within 150 yards of a herd, which moved off, watching the camel intently, without giving the chance of a shot. The best buck was always on the move, but I managed to gain the cover of a large bunch of weeds and peeped through the leaves. The camel was 500 yards away, circling slowly round, and about midway between us were some does—the rear-guard of the herd—conforming to the camel's movements, but watching it suspiciously the while. Thus I was the centre of a circle on the diameter of which moved the Chickara, and utilising the principle of interior lines, I soon gained a position within a short distance of their probable line of retreat. Manœuvring in this manner, I soon saw an old doe within 80 yards pioneering a big buck straight towards me, but they vanished in a fold of the ground not 50 yards distant, without giving a favourable opportunity for a shot. Being uncertain whether they might not reappear at any moment and discover me, I decided not to stir. Immediately afterwards another doe suddenly appeared on some open ground to the left and would have seen me had I moved. She was the leader of the herd, and was followed by several does and a young buck, moving in file across the open, about 90 yards distant. I began to wonder what had become of the big buck, when he suddenly dashed forward and routed the youngster by butting him in the haunches, and while he stood triumphant I pressed the trigger. He trotted forward 20 yards wagging his tail furiously, then wheeling round, galloped back a few paces, halted for a second, and fell dead. The bullet had grazed the heart. His horns measured 13 inches, the best I ever got. The morning's sport was not yet over, for I shot another buck on the way to camp, but while occupied in stalking a flock of eight bustards, a wandering camel-man found my Chickara, annexed it, and ran like the wind towards a village nearly a mile away, where pursuit would have been useless.

ARTHUR POLLOCK.

[*Note.*—The name Chickara or Chinkara is also erroneously applied to the **Four-horn** (*Tetraceros quadricornis*), an Indian water-loving antelope (see **Antelopes**).]

CHUB (*Leuciscus cephalus*).—[*See* ANGLING (COARSE FISH).]

MEASUREMENTS, &c.—Length of head 4½ to 5, of caudal fin 5¼, height of body 4 in the total length. *Eye*—diameter of each 5½ to 6 times in the length of the head, 2 diameters from the end of the snout, and 3 to 4 apart. Snout obtuse. Mouth rather deep, the upper jaw slightly overlapping the lower, and the posterior extremity of the maxilla reaching to beneath the front edge of the eye. The hindermost

[*Photo. by W. B. and C. C. Johnson.*

CHUB.

bone of the suborbital ring the largest. *Teeth*—pharyngeal teeth pointed and hooked at their extremities (in some slightly denticulated), 5, 2-2, 5. *Fins*—the dorsal commences midway between the end of the snout and the base of the caudal fin, its height exceeds by one-third the extent of its base. Pectoral as long as the head, excluding the snout. Ventral inserted on a line slightly anterior to the origin of the dorsal fin, its length equalling about half that of the head. *Lateral-line*—slightly concave, three rows between it and the base of the ventral fin. *Colours*—Muddy bluish or greenish colour along the upper surface of the head and body, becoming lighter on the sides and beneath. Dorsal and caudal fins dusky or greenish and externally dark; ventrals and anals bluish-white tinged with red. Cheeks dashed with red and gold. Day, *Fishes of Great Britain and Ireland*, vol. ii., p. 179.

CLOSE SEASONS.—Angling, *see* FENCE MONTHS. Shooting, *see* GAME LAWS.

COACHING.—*See* DRIVING.

COALFISH, or GREEN COD, or GREEN POLLACK (*Gadus virens*).—[*See* SEA-FISHING.]

MEASUREMENTS, &c.—Length of head, 4¼ to 4¾, of caudal fin 6, height of body 4¼ to 4¾ in the total length. *Eye*—diameters 3½ in the length of the head, 1 diameter from the end of the snout, and ⅔ to 1 diameter apart. Lower jaw prominent. The maxilla reaches to below to first third of the eye. A rudimentary barbel beneath the chin. *Teeth*—cardiform in the jaws, present on the vomer, absent from the palatines and tongue. *Fins*—the first dorsal triangular, its third ray the longest and equals the extent of its base; a distinct interspace between the first and second dorsal fins, the highest ray of which last equals half the length of its base; an interspace between the second and third dorsal fins, the latter not extending on to the caudal. Anal commences below the last rays of the first dorsal, and terminates below the end of the second dorsal; second anal similar to the second dorsal. Ventral on the throat inserted anterior to the base of the pectoral, which rather exceeds half the length of the head. Caudal slightly forked or truncated. Vent situated on a vertical line beneath the last rays of the first dorsal fin. *Colours*—superiorly gray, becoming silvery on the sides and beneath. Fins gray, the dorsal and caudal dark-edged. Usually a black spot at the axil of the pectoral fins, by which it is mostly concealed. As they get older the dark colour deepens. *Lateral-line*—white, which at once distinguishes it from the haddock, where it is black.—Day's *Fishes of Great Britain and Ireland*, vol. i., p. 294.

COCKFIGHTING.—(*See* SPORT, OBSOLETE.)

COD (*Gadus morhua*).—[*See* SEA-FISHING.]

MEASUREMENTS, &c.—Length of head 3⅔ to 4½, of caudal fin 6½, height of body 4 to 5, or even more in the young, in the total length. *Eyes*—diameter 4¼ in the young to 7 in the adult in the length of the head; 1½ diameters in the young to 2 in the adult from the end of the snout, and 1¼ in the young to 2 in the adult apart. Body much thickest anteriorly. Nostrils nearer to the eye than to the end of the snout. Snout conical. Mouth wide, with a deep cleft. Upper jaw the longer; the posterior extremity of the maxilla reaches to beneath the first third or middle of the eye. A barbel, generally as long as the eye, but sometimes shorter, is situated below the chin. *Teeth*—cardiform with an outer and much enlarged row in the upper jaw, in a V-shaped patch on the vomer, absent from the palatines and tongue. *Fins*—the first dorsal somewhat triangular; it commences over or slightly posterior to the base of the pectoral, its fourth ray being the longest and about equal to the extent of the base of the fin; from it they diminish in height to the last, which is very short. There exists a very short interspace between the bases of the two first dorsal fins, the fourth ray being somewhat the longest, but not quite equal to half the length of the base of the fin. They decrease in height to the three last, which are short. A very short interspace exists between the second and third dorsal fins, and a longer or shorter interspace occurs between its termination and the base of the outermost caudal rays. The anterior anal fin commences on a vertical line below the fourth or fifth ray

COD.

of the second dorsal, and a short interspace exists between it and the origin of the second anal, which is similar to the third dorsal. Caudal slightly emarginate, or square, at its extremity. Ventrals small, inserted rather before the base of the pectorals, which are as long as the postorbital portion of head. Vent situated on a vertical line beneath the first rays of the second dorsal fin. *Scales*—small and cycloid. *Lateral-line*—passes backwards from opposite the upper edge of the orbit, attaining below the centre of the second dorsal fin nearly the middle of the depth of the body, from whence it is continued straight to the centre of the base of the caudal. *Coecal appendages*—numerous and short. *Colours*—greenish or grayish, or olive, and occasionally covered with yellow or brown spots along the back and upper two-thirds of the body, its lower portion pure white. Lateral-line white, especially in its lower half. Fins gray, darkest towards their outer edges.—Day's *Fishes of Great Britain and Ireland,* vol. i., p. 277.

CONGER (*Conger vulgaris*). — [*See* Sea-Fishing.]

Measurements, &c.—Length of head 7 to 8, height of body 16 to 20 in the total length. Body anteriorly rounded, becoming compressed in its posterior portion. Head depressed. Mouth wide, the upper jaw very slightly the longer, its cleft extending to below the middle of the orbit. The posterior nostril patent, the anterior tubular. *Teeth*—cardiform in the upper jaw, one regular row of teeth of the same size and placed close together form a cutting edge; a short band on the vomer; cardiform likewise in the lower jaw similar to those in the upper. *Fins*—the dorsal commences above the last quarter or end of the pectoral: the anal in the middle of the total length. *Colours*—generally grayish, becoming lighter or even white beneath. A row of white spots marks the openings from the lateral line. The margins of the vertical fins black.—Day's *Fishes of Great Britain and Ireland,* vol. ii., p. 251.

CONSERVANCY OF RIVERS.—The United Kingdom is to a large extent mapped out into Fishery Districts, both as regards the sea-coast and inland portions of the country, and Boards or Committees have been formed to administer the law. As regards fresh waters, however, there are not many districts in which it can be said that the Boards have worked much or any improvement, and in not a few cases the majority of seats upon them have been obtained by men who represent the netting or commercial interest, and not only totally neglect the interests of sport, but have laid themselves open to the charge of allowing the netsmen to kill an excessive quantity of fish.

We propose to give a few suggestions as to the best means of increasing the stock of fish in rivers, &c., suggestions which we trust will be taken to heart not only by riparian owners, but also by the members of Fishery Boards. It should be stated at once, however, that as regards sea-fishery districts not a few committees have acted most wisely and beneficially in putting a stop to inshore trawling, a course which will, it is hoped, work great things for the sea fisheries adjoining our coasts. England does not stand alone in this action. The Government of Denmark owns valuable fisheries in territorial waters adjoining the Faröe Islands, which are now frequented by English fishermen who have, thanks mainly to the steam trawler, fished out the formerly prolific banks of the North Sea. In these Faröe fisheries Denmark has strictly prohibited trawling of every kind and description, and has made it an offence to be in possession of a trawl while in those waters. As a matter of fact, Continental and English fishermen have lost nothing by this salutary legislation, for they find themselves able to make immense takes of fish by means of long lines, whereas, had steam trawling been allowed, those fisheries might have been worked out in the course of a few years.

Netting.—As regards salmon rivers, netting is prohibited by law for a short period once a week, with the object of enabling the fish to ascend to the upper waters. But where rivers are long, and nets are used for a considerable distance above the tideway, the only result of this arrangement is that the fish which are missed during the weekly close time by the fishermen of the estuary get caught on Monday, when the close time ends, by the netsmen higher up. In such rivers it would be most beneficial to make different weekly close times for different portions of the river, for instance, making Saturday and Sunday a close time for the tidal portions, and Monday and Tuesday for a certain number of miles above the tidal portions. Or the weekly close time could be lengthened on all rivers, a proposed change which found favour with a recent Fishery Commission.

In cases where Fishery Boards derive an income from the sale of licences to netsmen and sportsmen, a large portion of the money so raised should be devoted to the artificial culture of salmon in salmon rivers, trout in trout streams, and coarse fish in other waters. River pollution, which is a standing disgrace to England and Scotland, should be most sternly dealt with, not so much as regards mere household sewage, but as regards the destructive chemical waste products which flow from mills and manufactories of all kinds. Nor must the upper portions of salmon rivers, which are the breeding grounds of the river, be neglected. These require to be made accessible by the removal of obstructions, the shallows in which the eggs are deposited kept clean, and the fish protected from poachers when spawning.

Steam Traffic.—Another point to which too little attention is given is the disturbance of fish by steam traffic in estuaries. It may be that the law would be required to deal with this matter, but it would be highly desirable in the interests of salmon and other fisheries that a limit of speed should be placed on big steamers entering those of our ports into which flow important salmon rivers. As the steam traffic increases in any river estuary, or other inlet of the sea, fish of all kinds, which are very shy creatures, as certainly decrease, and having regard to the importance of the fishing industry and the large rents paid by sportsmen for fishing rights, it only seems reasonable that restrictions of this kind should be placed upon the steamship owners.

Pisciculture.—With regard to trout streams, given a suitable extent of water and not too severe a climate, almost anything can be done within fair limits, thanks to fish culture. In some waters the stock is maintained by making a rather high weight or size-limit and returning everything beneath that weight or length, as the case may be, and most certainly the stock of fish can be maintained by this means, provided other conditions are favourable. But one result of this method is that the fish, being caught several times over during their youth, become, when over the size-limit, so exceedingly cautious and difficult to capture that all but first-class fishermen sometimes despair of making a reasonable basket.

We have more than once suggested that the stock could be equally well maintained by having a much smaller size-limit, and making it the rule to turn into the stream one or two yearlings or two-year-olds for every fish taken out. The fish would then rise more freely and better bags could be obtained (for, after all, the object of fishing is to catch fish), and by the continuous introduction of new blood the breed of fish would probably be improved. Yearling trout can be purchased at as low a rate as £10 a thousand, so that the outlay is inconsiderable. A man who gives £100 or more for his fishing rights should not hesitate to spend an extra £10 in restocking. Given suitable water, there is, as a matter of fact, no reason why he should even buy his fish, for they are very easily bred, as will be gathered from the article on PISCICULTURE (*q.v.*).

Where some suitable pond is available, fishery owners can hardly do better than stock it with yearlings and net it at the end of one or two years for the benefit of the main stream. But it should be a pond which can be run dry, for unless it can be emptied of water a certain number of trout will inevitably be left in, and these, on its being restocked with yearlings, will levy a heavy toll upon the new arrivals. Other details in connection with the preservation of trout are the prevention of pollution; the netting of all coarse fish, particularly pike and chub; the removal of mud if it collects in too large quantities on gravelly shallows, and the judicious cutting of weeds. When streams are very bare of cover they can be greatly improved by placing "hides" for the fish, such as drain-pipes, rocks, and the like. Very shallow streams can easily be deepened by means of dams, or can be widened out here and there into lakes. Ponds, moreover, containing only coarse fish can be emptied, cleared of mud, and stocked with trout. Many reservoirs have been stocked with great success.

Coarse Fish Streams.—As regards these, such as the Thames, the Trent, the Bedfordshire Ouse, the Welland, the rivers of the Broads, &c., much can be done to maintain a head of fish and provide a certain quantity for annual destruction by anglers, without going to much expense. In navigable rivers the stream traffic is perhaps the deadliest enemy of the fish, which, in the egg and early stages of fryhood, are destroyed in millions by the wash caused by launches or other steamers. Where it is possible, and the fisheries are valuable, steam traffic should be altogether prohibited, but where that course cannot be followed it should at least be prohibited during the spring months when coarse fish are spawning, or a rule could be made that no steamer should then be allowed to navigate the water at more than a certain number of miles an hour, or, as an alternative, that anyone in command of such a vessel driving it at a speed which creates any swell or wash should be guilty of an offence and be liable to a penalty. There is certainly no river in England in which the speed of the steam traffic might not without difficulty be limited during the spawning season.

The next greatest enemies to coarse fish are probably swans and ducks, the latter no less than the former. It is of the greatest importance that these be kept off the water from the 1st of March to the 1st of June. The amount of eggs which are picked off the weeds by half a dozen ducks in the course of a day is something astounding. I have seen a small brood of ducks work the side of a river for a mile or more in the course of an afternoon, and, so far as I could see, eat up every grain of the perch spawn which had been deposited there in considerable quantities. If these birds cannot be debarred from swimming in the river during the spawning months, the next best plan is to afford some protection to the spawn, and in the case of perch this is easily effected.

Men who are acquainted with the river know the spawning grounds, and after the perch eggs have been deposited, it is not difficult to cover them up with wire netting. But perch are accommodating creatures, and if open hurdles, within which withy wands or other twigs have been interlaced, are staked down in water about five to seven feet in depth, and surrounded by wire netting, the breeding fish will usually deposit their spawn upon the twigs, and there it will hatch out safe from swans and ducks. This has been done many times with great success in the Thames, in the Reading and Henley districts. Perch can be introduced without difficulty into any water by collecting perch eggs from rivers or canals where these fish abound, and placing them on hurdles in their new abode and protecting them as before explained.

Standard.—In coarse fish streams the standard of size, beneath which all caught must be returned to the water, is all-important. An excellent standard is in existence on the Thames, and it might be followed in any south country river. In the north, where the fish run rather smaller, it would have to be modified.

Thames Standard.

Pike or Jack	18 in.	Grayling	12 in.
Perch	8 "	Bream	10 "
Chub	10 "	Carp	10 "
Roach	7 "	Tench	8 "
Dace	6 "	Rudd	6 "
Barbel	16 "	Gudgeon	4 "
Trout	16 "		

Pike.—To preserve pike it is most desirable to prohibit trimmers and fishing either with live or dead gorge, methods which destroy every fish caught. In all streams, to defeat the pot-hunter, it is desirable to enact that no person may fish with more than two rods at one and the same time. Before this excellent rule, for which we were responsible, came into force on the Thames, we have known as many as ten rods to be used at one time by one fisherman, all laid out from the bank, and have seen five rods used from a punt by a person who was live-baiting for pike.

Food.—There is a phase of this subject which does not obtain the attention it deserves. It is the question of food. In rocky trout streams and in many a Highland loch there is insufficient food, and the result is a race of pigmy trout or other fish. Fresh-water snails, weeds which are prolific in insect life, fresh-water shrimps, and other fish food, may all be introduced. But the natural conditions of lake and river have to be considered in each particular case, and the would-be improver of his fishery should take skilled advice before tampering with his water. One thing should be borne in mind, that there are very few streams or lakes which will produce a large number of large fish; it is generally a choice between a few large fish or many small ones.

JOHN BICKERDYKE.

CORACLES. — The osier-woven, skin-covered basket of the Ancient Britons still survives on the Welsh rivers, more particularly on the Dee, in the shape of the Coracle, the fisherman's boat of those rapid streams. With slight variations of shape, even in modern times it may yet be described as a square basket with a seat across it, and at a little distance its occupant looks as if he had gone afloat in a washing tub. But no other kind of craft would so well suit the solitary angler on the rapids of the Dee or Severn as this odd-shaped vessel. With one hand wielding the paddle and the other his fly-rod, he drifts down the rippling shallows, shoots the boiling rapids, and paddles gently along the still deeps. Then, when his fishing is over, he claps the Coracle upside down on his head and shoulders, and stalks back.

As a Coracle is so easily transported, either by manual power or on a donkey or pony cart, it is somewhat surprising that its use has not spread to Scottish moorland lochs and the smaller rivers. One man can propel it and fish from it at the same time, which is not usually the case with any other type of boat, and if it rains heavily he can land and use it as an umbrella. Its use is not confined to trout-fishing. It is constantly used for salmon-fishing, but in such cases it is advisable to land to play a fish, for a Coracle, having four sides instead of two, has four ways of capsizing instead of the two ways of the ordinary row boat. A Coracle may be made in a day, except for the drying of the tar or paint, and it would not be difficult to carry the necessary laths and a square of canvas already waterproofed to any outlandish place where a boat might be needed.

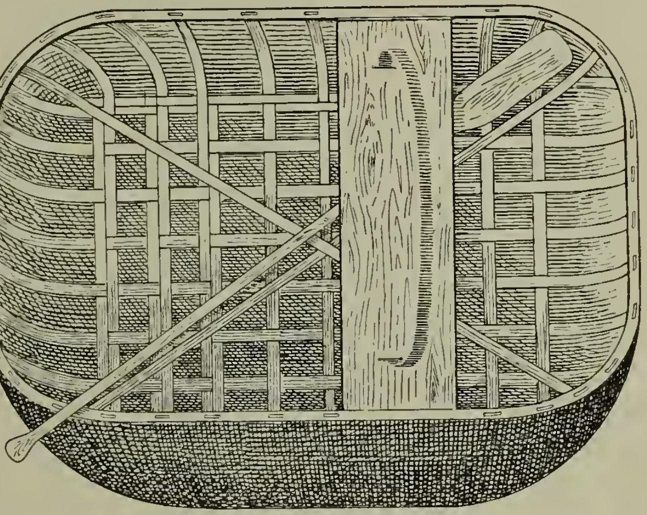
The dimensions of a Coracle are about as follows:—The square on the floor or water-line is four feet, and the sides tumble in six inches, so that the square at the gunwale is three feet. The depth is thirteen inches; the square has of course rounded corners. Older Coracles had straight sides or a flare out on the front side, but the tumble-in type gives the most stability, having a wider floor. The width of the gunwale square is limited by the fact that the occupant must sit in the middle and be able to ply his paddle over the side without leaning over. The bottom is flat and the draught only two or three inches.

To make the frame, get twenty long, clean laths, say eight feet long, by one inch and a half wide by three-sixteenths of an inch thick. Interlace ten across the other ten so as to form a lattice nearly four feet square, with the ends of the laths projecting about two feet. Bend these ends up to meet the previously prepared frame of the gunwale and fasten. Place a seat across from one side to the other and have some light floor-boards, and the frame of the boat is complete. Cover with canvas, and coat with boiling tar and pitch or, as in my own experience I prefer, good white lead paint made gray or brown in colour to match the boulders in the river. The single paddle is like the lower half of a flat-bladed scull, but very much lighter in make, and is about four feet long. It is held in the hand midway, with the shaft braced against the outer side of the upper arm; the palm of the hand is towards the boat, and preferably the shaft should be grasped between the first and second fingers. The stroke follows the shape of a figure of eight, propelling the Coracle sideways, and is not easy to acquire at first. The efforts of the Sassenach to guide his Coracle, and prevent it from doing nothing but spin round have formed the subject of much amusing caricature in Wales.

In the shallows, of course, the Coracle may be stopped, retarded, or guided by pressing the paddle on the stones, and if the current is not too strong it may be worked from side to side of the river as it floats down, so that every part may be fished. It is essentially a craft which must go with the current on a river and with the wind on a lake, but it is so light that it is easily carried back to the starting point.

I have known a fisherman who thought nothing of walking ten miles up stream, with his Coracle on his back, for the purpose of fishing down.

Sometimes two persons use the Coracle, one paddling and the other fishing, usually a professional and a visitor; but to enjoy the true sport of Coracle-fishing, one should be alone.



CORACLE.

G. CHRISTOPHER DAVIES.

CORACLES, INDIAN.—These are made umbrella-shaped, 8 ft. across, 2 ft. deep, being a convenient size for fishing purposes. They are of split bamboo basket-work, covered with sewn ox-hide and without seat of any kind. Such a coracle, which can be easily carried by one man, and will comfortably hold two, is propelled by a paddle; and as it draws but a couple of inches of water, and will bear hard bumps against rocks, is invaluable for descending rocky rivers, floating buoyantly down many a rapid, apparently impossible of navigation. Large coracles of this description have been used for ferrying troops.

CORMORANT (*Phalacrocorax carbo*).—The Cormorant is a large sea fowl of dark green colour, looking uniformly black at a distance, weighing from seven to eight pounds, and characterised by a long straight beak strongly decurved at the extremity, a stiff rudder-like tail of fourteen feathers, and feet with all four toes united by a membrane. In this respect it agrees with another species of the same genus, which also inhabits the rocky portions of our coast, namely, the Crested Cormorant, or Shag (*P. cristatus*), a small bird, without the white patch on the thigh, and with only twelve instead of fourteen tail feathers. Both species breed gregariously in sea cliffs, on rocky islands, and occasionally in trees, after the manner of herons and spoonbills, forming a large clumsy nest of sticks and seaweed, in which are deposited four or five chalky-looking eggs. When taken young from the nest or captured soon after it has quitted it, by means presently to be described, the Cormorant is easily tamed, and may be taught to exercise its natural aptitude in taking fish for the pleasure of its owner.

CORMORANT.

The earliest description which the writer has met with of the sport as observed in China by a European occurs in an English translation by R. Willes (from the Italian version first printed at Venice) of a Portuguese MS. by one Galotti Pereira, who, about the middle of the sixteenth century, was with others of his countrymen a prisoner in China. It occurs under the heading "Reportes of the Province China" in a small and rare quarto volume entitled *The History of Trauayle in the West and East Indies and other countreys lying eyther way towards the fruitfull and ryche Moluccaes.* By Richarde Eden, 1577. At page 253 we read:—"At the houre appoynted to fyshe, all the barges are brought togeather in a circle where the ryver is shalowe, and the crowes, tyed togeather under the wynges, are let leape downe into the water, some under, some above, worth the lookying uppon; eche one as he hath filled his bagge, goeth to his own barge and emptieth it, whiche done, he retourneth to fyshe agayne."

This was at Pekin, where the travellers in question saw no fewer than twenty barges so employed. A more satisfactory account of the practice may be found in Milne's *Life in China,* 1857 (p. 307).

It is most likely that the sport was first made known in Europe towards the end of the sixteenth century by the Dutch, who, besides being enterprising navigators and traders in the East, have in all ages been known as skilful falconers and great bird-fanciers. In 1609 Louis XIII., then a youth, witnessed this sport in the grounds at Fontainebleau, and in 1611 our own James I. had appointed "a master of Cormorants" in England. An entry in the "Issues of the Exchequer" of that reign shows that in April 1611 John Ward was paid £30 "for his trouble in bringing up and training of certain fowls called Cormorants, and making of them fit for the use of fishing." In May of the following year he was appointed "to travel into some of the further parts of this realm for young Cormorants, which afterwards are to be made fit for his Majesty's sport and recreation," for which he received another £30.

In 1618 the King had become so fascinated with the sport, that he decided to build a house and make some ponds for his Cormorants, ospreys, and otters at Westminster, and for this purpose he leased of Lord Danvers a piece of meadow ground, about an acre and a quarter, lying in the Vine Garden near Westminster Abbey, at the yearly rent of £7. A brick building was erected on this ground, at a cost of £100, and nine fish-ponds were dug, costing altogether another £40. These ponds were stored with carp, tench, barbel, roach, and dace (100 of each), and a sluice of elm planking was made to bring the water from the Thames. The total outlay incurred upon this, the first Westminster Aquarium, was £268, for which amount, in August, 1618, the King gave an order upon the Treasury.

At Theobalds, also, his favourite hunting seat in Hertfordshire, and also at Thetford, in Norfolk, these birds were employed in fishing for the King's pleasure.

Of late years the sport has been revived both in England and France, thanks to the efforts of Captain F. H. Salvin and the late John Barr in this country, and to the Comte le Couteulx, M. Pichot, and M. de la Rue in France.

Cormorants are not difficult to train, and do not require nearly so much care as hawks. They may be taken from the nest when they are ready to fly, or may be caught later in the year when fully feathered. The latter plan is preferable, for the birds have then had some experience in fishing, and are sure to be in good condition.

To catch them, it is only necessary to visit some tidal harbour wherein there are large posts set (to mark the river channel), on which Cormorants are fond of resting. A few strong gins, having the teeth bound with list to prevent injury, may then be set, unbaited, on the square tops of two or three of the favourite posts, each gin being attached to the post by a line with a float. It is easy to arrange with a fisherman to keep watch in a boat at a little distance; and as soon as the Cormorant alights and is trapped, it will come off at once into the water, and should be taken up as soon as possible. A cloth should be thrown over the back and wings, two corners being tied securely under the chin, and the other two corners under the tail behind the legs. The bird may then be tethered by the legs until brought ashore. While this operation is being performed, it should be held firmly, yet gently, by grasping first the back of the head and then the closed beak, care, of course, being taken to avoid a bite, which would be a very sharp one.

On getting ashore with two or three captures, the flight feathers of the left wing should be cut neatly with a large pair of scissors, and the birds turned into a loose box, or any outhouse from which they cannot escape, care being taken to lay down straw, tan, or sawdust, to prevent the breakage of the stiff tail feathers, which form so useful a rudder when in the water. Here they may be fed on fish, until such time as they can be forwarded to their ultimate destination. The training is commenced by putting soft leather straps, or "jesses," on one or both legs, as with a hawk, to which a line is attached when the bird is first allowed in the water.

It is taught (like a hawk) to come to "the lure"—a tin box containing its food, which is rattled every time the bird is fed —and may even be carried on the gloved hand like a falcon. A small leather strap being buckled round the lower part of the neck before the bird is allowed to enter the water, it is unable to do more than pouch any fish that it may catch, and has to come ashore to be relieved of its burden by its master, who rewards it every time for its obedience. After a little practice the line is dispensed with, and the bird soon becomes very docile, seeming fully to understand all that is required of it.

The Chinese method of fishing with Cormorants differs but little from that employed by English and French amateurs at the present day. In China, however, the birds, smaller than our *Phalacrocorax carbo,* and of a different species (*Phalacrocorax sinensis,* called by the Chinese *Leu-tze*), are carried on light shallow punts or rafts, and are commonly employed, not, as here, for amusement, but as a matter of business to supply the markets with fish.

[*Photo. by W. S. Berridge.*

CORMORANTS.

J. E. HARTING.

COURSING is one of the most ancient of field sports. King Solomon speaks of the greyhound as an example of what "goes well, and is comely in going." From the Greek historian, warrior, and philosopher, Arrian, who flourished in the second century of the present era, we gather everything worth knowing of coursing as practised by the people of his time. Many of the forms and methods of those days are still adhered to, though it is singular to note in Arrian's writings on the subject an entire absence of any code of rules or laws for gauging the merits of the competing greyhounds.

Although coursing was an undoubtedly popular pastime in the British Isles during the Middle Ages, it is some centuries later ere one discovers evidence of its being carried on with a due regard to the system and regularity that characterise the coursing of the present day.

The first authenticated code of rules for judging the work done by a brace of greyhounds in pursuit of a hare was compiled in the days of Queen Elizabeth. The title runs (probably a revised version): "*The Laws of the Leash or Coursing, as they were commanded, allowed, and subscribed by Thomas, late Duke of Norfolk, in the reign of Queen Elizabeth.*" These rules governed coursing until about the third quarter of the last century, when the sport, which hitherto had been confined to matches between braces of greyhounds, underwent a complete revolution.

Origin of Coursing Clubs.—Clubs then sprang into existence, the first of these institutions being located at Swaffham, in Norfolk, with Lord Orford as its founder. There is a Swaffham Club at this present day, but it is only a recent namesake of the old association, though coursing over the very same ground. Coursing clubs quickly became the fashion, after the foundation of the Swaffham Club, and one of the earliest was Ashdown, in Berkshire, under the patronage of the then Earl of Craven. Successive owners of this incomparable coursing country have been actively identified with the sport, but the club long ago dropped out of existence, whilst the splendid open meetings which followed—frequently lasting over a week—have at last dwindled away.

The numberless coursing clubs that at one time or other in the latter part of the last and in the present century were in existence, are, with very few exceptions, extinct. Amongst the oldest yet living may be mentioned the Altcar Club, the Ridgway Club, the Scottish National Club, and the North of England Club. The **Altcar Club**, established in 1825 by the then Earl of Sefton, has all these years enjoyed the privilege of using the fine lands of the Sefton estates, near Liverpool, and the present peer, his father, and grandfather, were successively president. The **Ridgway Club** was founded some years later than the Altcar Club, and the membership of the two is at the present time, and has long been, identical. The ground coursed on is the splendid Clifton Hall estate, near Lytham, in Lancashire. The club owes its now historical name to Mr. Thomas Ridgway, its first president. Of the **Scottish National Club** it need only be said that, having passed through many vicissitudes in consequence of loss of ground, it is now apparently firmly planted on the Kinmount estate in Dumfriesshire, through the kindness of Mr. Charles Brook, who takes an especial interest in its fortunes, although not a courser himself.

In Ireland, where the instinct of sport is naturally keen, many old and influential coursing clubs of times past are now forgotten, not to omit the open meetings which for many years were held over the historical Raughlan and Derrymacash meadows of the late Lord Lurgan in county Armagh, and attracted crowds of sportsmen from every corner of the kingdom.

Laws of Coursing.—Reverting to the laws that govern coursing, the old system of the Duke of Norfolk's time was pretty well done away with early in the present century; indeed, in 1828, the members of the Ashdown Park Club compiled a code of their own. Half a dozen years later a new set of rules was promulgated for general use by Mr. Thomas Thacker, who also introduced a yearly calendar of the sport. These latter rules were more or less in use until 1858, when it was universally agreed that coursing having become so popular in England, Ireland, and Scotland, the time had arrived when an association should be founded for its government on some such lines as the Jockey Club, which controls racing. Accordingly a small committee, consisting of Mr. Edward Marjoribanks, Mr. W. G. Borron, and "Stonehenge" (of *The Field*) was deputed to draw up rules for the establishment of the **National Coursing Club**. The first president was appropriately Mr. Marjoribanks, and on his death he was worthily succeeded by the fourth Earl of Sefton, who was succeeded by his son. The National Coursing Club itself is composed of delegates from the different clubs, with a certain number of elective members. Meetings are periodically held during the year in London and Liverpool, whilst business matters and cases of complaint are dealt with by a standing committee. With the founding of the National Club, coursing was at length put upon a business-like basis, as, though hitherto there had been rules for deciding the merits of the competing greyhounds' work, regulations for the mere conduct of a meeting had been almost unknown. As time rolled on the necessity for a systematic record of a greyhound's breeding and antecedents became most apparent, and in 1882

After W. Frank Calderon.

COURSING.

the **Greyhound Stud Book** was instituted, by means of which it is, in many instances, possible to trace back the genealogy of an animal to the eighteenth century; but, most important of all, no greyhound can be registered without a pedigree, and no greyhound is qualified to run in public unless its name appears in the "Stud Book" [*see* STUD BOOKS]. In these directions complete control has been acquired over coursing in the United Kingdom by the National Coursing Club, and it is a safe assertion that no field sport is more systematically conducted than is coursing at the present day.

The passing of the "Ground Game Act" in 1880 undoubtedly arrested the prosperity of coursing throughout the kingdom—indeed, in very many quarters it was feared that a crisis had come, and that the total extinction of the old pastime was but a question of a few years at the utmost. The effects of the measure were more especially and speedily felt in Scotland, meeting after meeting dropping out of existence through force of circumstance. A striking illustration of the extent to which coursing has fallen away over the Borders may be gathered from the fact that, whereas up to the year 1880 nearly a hundred days' running was customary during the six months' season, for years past no more than a dozen or fourteen days can be mustered.

In England and Ireland, however, the storm has been successfully weathered, and coursing farmers are strong enough in numbers to ensure a supply of hares for many a year to come, in co-operation, of course, with landed proprietors like Lord Sefton, Lord Kimberley, Lord Londonderry, Sir Charles Scarisbrick, Sir Richard Graham, Sir Thomas Gooch, Mr. Clifton, Mr. Birkbeck, and many others; while Scotland may still count upon the cordial assistance of Sir Robert Jardine, Bart., Mr. Edward Brook, and Mr. Charles Brook.

NATIONAL COURSING RULES.

CONSTITUTION AND BYE-LAWS, AND CODE OF RULES, AS REVISED AND ADOPTED BY THE NATIONAL COURSING CLUB, JUNE 28, 1893, WITH ALTERATIONS AND ADDITIONS UP TO FEBRUARY 15, 1910.

CONSTITUTION AND BYE-LAWS.

(*a*) The National Coursing Club shall be composed of Members elected by the Coursing Clubs of the United Kingdom of more than one year's standing, having not less than twenty-four Members each, and of Members elected as hereinafter provided.

(*b*) No Coursing Club shall elect more than two representatives, the names and addresses of the representatives so elected to be sent to the Secretary of the National Coursing Club; and should any Club fail to hold a Coursing Meeting for two consecutive seasons, that Club shall cease to send representative members.

(*c*) The National Coursing Club may elect as Members of the Club (the number of Members so elected not to exceed twenty-five) any well-known supporters of public coursing, who have been proposed and seconded by two Members of the National Coursing Club, at either of the Club meetings held in London on the last Wednesday in June, or in Liverpool on the day of entry for the Waterloo Cup.[1] Members are elected by the National Coursing Club for five years, and are eligible for re-election. A month's notice must be given to the Secretary of the names of candidates for election to the National Coursing Club, with their addresses, and the names of their proposers and seconders, before they can come up for ballot. The election shall be by ballot, in which one black ball in seven shall exclude. If a quorum of Members be not present, then the election shall stand over till the next meeting of the National Coursing Club. The Secretary shall insert in the notice of business to be transacted at the meetings of the National Coursing Club the name of any candidate for election, with his address, and the names of his proposer and seconder.

(*d*) The National Coursing Club shall annually, on the day of entry for the Waterloo Cup, elect two of its members as President and Treasurer, and two of its members as Auditors. At all its meetings seven shall be the quorum. The Standing Committee to appoint Secretary and Keeper of the Stud Book, at such remuneration as they from time to time shall decide.

(*e*) Coursing Clubs desirous of joining the National Coursing Club must send evidence of their qualification to the Secretary. All clubs having joined the National Coursing Club, must subscribe £2 annually, and all Members elected by the National Coursing Club £1 annually, to the funds of the National Coursing Club, payable on the 1st of January of each year to the Secretary of the National Coursing Club. No representatives of any Club which has not paid its subscription, and no members elected by the National Coursing Club, who have not paid their subscriptions on or before the day of entry for the Waterloo Cup, shall be allowed to attend the meeting of the National Coursing Club on that day. All Clubs, with their representatives, and all Members of the National Coursing Club whose subscriptions have not been paid on or before the first day of June in each year, shall cease to belong to the National Coursing Club. At the Summer Meeting, in each year, a statement of income and expenditure shall be submitted by the Treasurer and Secretary.

(*f*) Every Coursing Meeting shall, unless the contrary be declared by the Programme of an Open Meeting or by Club Rules, be subject to all the Rules and Regulations of the National Coursing Club. Every question or matter in dispute connected with coursing can be brought before the National Coursing Club for its decision.

(*g*) The affairs of the Club shall be administered by a Committee, called the Standing Committee, consisting of the President of the Club, and not less than seven members annually elected, of whom five only shall be eligible for re-election. Except as hereinafter provided, three members of the Standing Committee shall form a quorum, with full and absolute power to deal with all business under the Constitution and Bye-laws, and Code of Rules of the Club. All business dealt with, including all complaints made to, heard before, and decided by, the Standing Committee, shall be reported annually to the Club meeting, held at Liverpool, on the day of entry for the Waterloo Cup. The Standing Committee shall have power to appoint Sub-Committees to deal with Irish and Scottish business, other than complaints of discreditable conduct investigated under Rule 41 of the code of rules and bye-law (*h*).

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[1] See Bye-law (*l*).

(*h*) The Standing Committee shall have full and absolute power to inquire into, and determine, all complaints of discreditable conduct investigated under Rule 41 of the Code of Rules of the National Coursing Club, and when such complaints are found to have been proved, to impose such penalty or penalties as may be authorised by the Constitution, Bye-laws, and Code of Rules of the National Coursing Club upon the offenders. For the conduct of such investigations the Standing Committee shall consist of not less than five members, and if any person shall feel himself aggrieved by the decision of the Standing Committee, he may appeal against it to the members of the Club at its next meeting for the dispatch of business, held in Liverpool on the day of entry for the Waterloo Cup. Notice of appeal must be given by the person aggrieved to the Secretary within fifteen days of the date of the decision of the Standing Committee. The members of the Club attending the meeting shall re-hear the case, and may by a majority of at least two-thirds of those present confirm or vary the decision of the Standing Committee, as well as any penalty imposed under it; but if less than two-thirds vote to confirm, or vote to vary the decision, it shall be deemed to be rescinded and annulled by the Club. Before any complaint of discreditable conduct is investigated by the Standing Committee, the Secretary shall give notice to the person implicated of the time when, and place where, the Standing Committee will investigate such complaint, and if he appears in pursuance of such notice, shall give him an opportunity of being heard by himself and of calling evidence in his defence. Any person appealing from a decision of the Standing Committee shall have the same right of being heard by himself and of calling evidence in his defence on such appeal; but neither before the Standing Committee, nor at the meeting of the Club, shall any person be represented by solicitor or counsel. The decision of the Standing Committee is to be in force unless and until reversed by the National Coursing Club.

(*i*) Every decision of the National Coursing Club shall be final, and the National Coursing Club may order that the expenses attending any case or matter in dispute brought before it, shall be borne by the parties interested as the National Coursing Club may direct.

(*j*) The Secretary shall place on record in the minutes of the business of the National Coursing Club all complaints investigated by the Standing Committee under Rule 41 of the Code of Rules, and their decisions upon such complaints, and if no notice of appeal against any decision of the Standing Committee be lodged with the Secretary within fifteen days of its pronouncement, the Secretary, subject to the direction of the Standing Committee, shall be empowered to publish it in the "Greyhound Stud Book" and in the newspapers. The same right of publication, subject to the direction of the Standing Committee, shall exist in regard to complaints heard on appeal by the members of the National Coursing Club in Liverpool, on the day of entry for the Waterloo Cup, where the appellant has failed to obtain the rescission of the decision of the Standing Committee.

(*k*) Except as hereinbefore provided under Bye-law (*j*), the Secretary shall place on record in the minutes of the business of the National Coursing Club, and may forthwith send to the Keeper of the "Greyhound Stud Book," and make public, every question and matter in dispute brought before the National Coursing Club or the Standing Committee, with the decision arrived at.

(*l*) Meetings for the despatch of business shall be held in London on the last Wednesday in June and first Wednesday in December, and in Liverpool on the day of the draw of the Altcar Club Meeting in November, and on the day of entry for the Waterloo Cup. The revision and alteration of rules can only be made, and the election of Members can only take place, at the Summer Meeting in London and at the Meeting in Liverpool on the day of entry for the Waterloo Cup. The Secretary, upon a requisition addressed to him in writing by any Three Stewards of a Meeting held under the National Coursing Club Rules, or by Six Public Coursers, Members of an established Coursing Club, may call a Special Meeting of the National Coursing Club at such time and place as the President may appoint.

NOTE.—A motion was adopted at the meeting of the Club, February 20th, 1900, that the meetings of the Club, other than the annual meeting on the day of entry for the Waterloo Cup [Bye-laws *d* and *l*], be left at the option of the Standing Committee.

(*m*) A month's notice must be given to the Secretary of any business or proposed alteration of Rules before it can be discussed at an Ordinary Meeting of the National Coursing Club; and at a Special Meeting nothing but the special business for which the meeting was called can be brought before it.

(*n*) The Secretary of the National Coursing Club shall be allowed, subject to approval by the National Coursing Club at the Summer Meeting, all expenses incurred by him in connection with the National Club during the preceding year.

(*o*) Every person who enters a dog at any meeting held under the Rules of the National Coursing Club submits himself to the Constitution, Bye-laws, and Code of Rules of the National Coursing Club, and to the jurisdiction of the Standing Committee, and of the Club, and consents to the publication of any matter or decision permitted under and governed by the Rules and Bye-laws of the Club.

(*p*) Any person running a greyhound at an advertised meeting not under the bye-laws and rules of the National Coursing Club shall be disqualified from running a greyhound at any regular meeting during the pleasure of the Standing Committee, and every greyhound the registered property of such person shall in like manner be disqualified.

CODE OF RULES.

1. *The Secretary and Stewards.*—For any proposed Open Meeting a Committee of not less than three shall be formed, who, with the Secretary, shall settle preliminaries. The management of the Meeting shall be entrusted to this Committee, in conjunction with Stewards, who shall be elected by the subscribers present at the first evening of the meeting. The Secretary, if honorary, shall be a member of the Committee and a Steward *ex officio*. The Stewards alone shall decide any disputed question by a majority of those present, subject to an appeal to the National Coursing Club. No Steward shall have a right to vote in any case relating to his own dogs. The Secretary shall declare, on or before the evening preceding the last day's running, how the prizes are to

be divided; and shall give a statement of expenses, if called upon to do so by any six of the subscribers, within fourteen days after the meeting. No stakes shall be paid until fourteen days after the completion of a meeting; but all stakes must be paid within thirty days.

2. *Ex Officio Stewards.*—Members of the National Coursing Club present at any Coursing Meeting shall be *ex officio* Stewards of such Meeting, together with the Stewards elected by the subscribers present on the first evening of the meeting, provided always that such Stewards *ex officio* shall not exceed three. Members of the National Coursing Club may be elected by the subscribers as Stewards of a meeting.

3. *Election of Judge.*—The Judge may either be appointed by the Secretary and Committee acting under Rule 1, in which case his name shall be announced simultaneously with the meeting, or elected by the votes of the subscribers taking nominations; but each subscriber shall have only one vote, whatever the number of his nominations. Not less than ten days' notice of the day of election shall be given to the subscribers, and the appointment shall be published at least a fortnight before the meeting. The names of the subscribers voting, with the votes given by them, shall be recorded in a book open to the inspection of the Stewards, who shall declare the number of votes for each Judge, if called upon to do so by any of the subscribers. When a Judge is prevented from attending or finishing a meeting, the Committee and the Stewards (if appointed) shall have the power of deciding what is to be done.

4 *Description of Entry.*—Every subscriber to a stake must name his dog before the time fixed for closing the entry, giving the names (the running names if they had any) of the sire and dam of the dog entered. The Secretary shall publish on the cards the names of those who are subscribers, but do not comply with these conditions. These nominations shall not be drawn, but must be paid for. For Produce Stakes the names, pedigrees, ages, colours, and distinguishing marks of puppies shall be detailed in writing to the Secretary of a meeting at the time of the original entry in all Puppy Stakes, and a subscriber must, if required, state in writing to the Secretary, before or during the meeting for which such entry is made, the names and addresses of the parties who reared his puppies; and any puppy whose marks and pedigree shall be proved not to correspond with the entry given shall be disqualified, and the whole of its stakes or winnings forfeited. No greyhound is to be considered a puppy which was whelped before the first of January of the year preceding the commencement of the season of running. A sapling is a greyhound whelped on or after the 1st of January of the year in which the season of running commenced.

5. *Registration.*—Every litter of Puppies shall within two months of the date of whelping be registered free of charge, with the names of the sire and dam, and the colour (subject to correction within six months of the date of whelping), sex, and number of the Puppies, under a penalty of £1 A fee of five shillings shall also be paid for the Registration at the time of naming of each puppy not registered according to the above requirements. The Colours, Sex, Names, Pedigrees, and Ages of all Greyhounds, with the Names of their owners, and the owners of their sires and dams, must be registered in the Stud Book. The Registration fee shall be one shilling and sixpence for each Dog registered on or before 30th of June, and an additional fee of two shillings shall be charged for the Registration of all Greyhounds (other than Saplings) after that date to the end of the coursing season immediately following. Any owner by payment of thirty shillings annually may compound for the Registration of any number of Greyhounds *bonâ fide* his own property. No Greyhound shall be registered whose sire and dam have not been registered; provided always that such sire and dam may be registered at the same time on payment of a fee of ten shillings for each dog; but the pedigree, with name of owner of such sire and dam, must be supplied to the Keeper of the Stud Book, and verified, if necessary, before such registration. Every change of ownership must be registered at a fee of one shilling. A Certificate of Registration must be given on payment of the fee.

6. *Stud Book.*—The Greyhound Stud Book shall be published, under the authority of the National Coursing Club, on the 15th day of September.

7. *Time for Registration.*—The Registration of Greyhounds shall be made on or before the 30th day of June, and Registrations made after that date, if they do not appear in the Stud Book of that year, will appear in that of the following year.

8. *Names.*—If the same name has been given to more than one greyhound, the Keeper of the Stud Book shall give priority to the dog first registered, and shall add to every other such name, except the one first registered, a numeral, commencing with II. Names once used will not be again available until after a lapse of ten years.

9. *Greyhounds not Registered are Disqualified.*—All Greyhounds whose names do not appear in the Stud Book, or whose owners cannot produce a Certificate of Registration from the Keeper of the Stud Book on being required to do so by a Steward, or by the Secretary of any Coursing Meeting, shall be disqualified, and shall forfeit all Entry Money which may have been paid, and any Stake or Prize, or Share of any Stake or Prize won at such Meeting, and such Entry Money, Stake, or Prize, or Share thereof, won by any Dog so disqualified, shall be disposed of as provided by Rule 38 applicable to disqualification.

10. *Payment of Entry Money.*—All moneys due for nominations taken must be paid at or before the time fixed for closing the entry, whether the stakes fill or not, and although, from insufficient description or any other cause, the dogs named may be disqualified. No entry shall be valid unless the amount due for it has been paid in full. For all Produce and other Stakes, where a forfeit is payable, no declaration is necessary; the non-payment of the remainder of the entry money at the time fixed for the purpose is to be considered a declaration of forfeit. The Secretary is to be responsible for the entry money of all dogs whose names appear upon the card.

11. *Alteration of Name.*—If any subscriber should enter a greyhound by a different name from that in which it shall have last been entered to run in public, or shall have been registered in the Stud Book, he shall give notice of the alteration to the Secretary at the time of entry, and the Secretary shall place on the card both the late and the present names of the dog, and this must be done at all meetings at which the dog runs throughout the coursing season in which the alteration has been made. If notice of the alteration be not given, the dog shall be disqualified. The new name must be registered before the dog can run under it.

12. *Prefix of "Ns."*—Any subscriber taking an

entry in a stake must prove to the satisfaction of the Stewards, if called upon by them to do so, that any greyhound entered by him, without the prefix of the word "Names," is *bonâ fide* his own property. If a subscriber enters a dog not his own property, without putting "ns" after his own name, the dog so entered shall be disqualified. Every subscriber shall, if requested, deliver in writing to the Secretary of the meeting the name of the *bonâ fide* owner of the greyhound named by him, and this communication is to be produced should any dispute arise. No dog purchased or procured for a less time than the entire period still remaining of its public running, or belonging to two or more persons, unless they are declared confederates, shall be held as *bonâ fide* the property of a subscriber. A copy of the lease of a greyhound, registered or re-registered, must be lodged with the Keeper of the Stud Book at the time of such registration or re-registration. The names of confederates must be registered with the Keeper of the Stud Book—fee, one shilling for each name. Assumed names must also be registered with the Keeper of the Stud Book—fee, five guineas.

13. *Death of a Subscriber.*—The death of a subscriber shall only affect his nominations if it occur before the draw, in which case, subject to the exceptions stated below, they shall be void, whether the entries have been made or not, and any money received for forfeits or stakes shall be returned, less the proportion of expenses when the amount has been advertised, and when the nominations rendered vacant are not filled by other subscribers. If he has parted with all interest in the nominations, and dogs not his property are entered and paid for, such entries shall not subsequently be disturbed. When dogs that have been entered in Produce Stakes change owners, with their engagements and with their forfeits paid, the then owner, if entitled to run them in those stakes, shall not be prevented from doing so by reason of the death of the former owner.

14. *Draw.*—Immediately before the greyhounds are drawn at any meeting, and before nine o'clock on every subsequent evening, the time and place of putting the first brace of dogs into the slips on the following morning shall be declared. A card or counter bearing a corresponding number shall be assigned to each entry. These numbered cards or counters shall then be placed together and drawn indiscriminately. This classification, once made, shall not be disturbed throughout the meeting, except for the purpose of guarding, or on account of byes.

15. *Guarding.*—When two or more nominations in a stake are taken in one name, the greyhounds, if *bonâ fide* the property of the same owner, shall be guarded throughout. This is always to be arranged, if possible, by bringing up dogs from below to meet those which are to be guarded. This guarding is not, however, to deprive any dog of a natural bye to which he may be entitled, either in the draw or in running through the stake. The withdrawal at any time of a dog from a stake, shall not deprive a dog of a bye, accidental or natural, to which it would have been entitled had the withdrawn dog remained in the stake. Dogs, whose position has been altered in consequence of guarding or of byes, must return to their original position in the next round, if guarding does not prevent it.

16. *Byes.*—A natural bye shall be given to the lowest available dog in each round. No dog shall run a second such bye in any stake, unless it is unavoidable. When a dog is entitled to a bye, either natural or accidental, his owner or nominator may run any greyhound he pleases to assist in the course, provided always that in Sapling Stakes only a sapling may be used, and in Puppy Stakes none older than a puppy. But if it is proved to the satisfaction of the Stewards that no sapling or puppy respectively can be found to run an accidental bye, an older dog may be used. No dog shall run any bye earlier than his position on the card entitles him to do. The slip and the course in a bye shall be the same as in a course in which a decision is required, and the Judge shall decide whether enough has been done to constitute a course, or whether it must be run again, and in the latter case the Judge shall give the order. If at the commencement of any round in a stake, one dog in each course of that round has a bye, those byes shall not be run, but the dogs shall take their places for the next round as if the byes had been run. A bye must be run before a dog can claim the advantage of it. Byes or participation in winnings, through being entitled to byes, shall count as courses won.

17. *Slip Steward.*—The Committee of an open meeting and the members of a club meeting shall appoint, on the first evening of a meeting, a Slip Steward, whose duty shall be to see that the right greyhounds, both in courses and byes, are brought to slips in their proper turn; to report to the Stewards, without delay, any greyhound that does not come to the slips in time, and any act on the part of the slipper, nominators, or their representatives, which he may consider should be brought to their knowledge. If a nominator or his representative should refuse to comply with the directions of the Slip Steward, or should use abusive or insulting or threatening language towards him, he shall be at once reported to the Standing Committee. A Slip Steward cannot be both Slip Steward and Flag Steward at any coursing meeting.

18. *Postponement of Meeting.*—A meeting appointed to take place on a certain day may, if a majority of the Committee and the Stewards (if appointed) consider the weather unfit for coursing, be postponed from day to day; but if the running does not commence with the current week all nominations shall be void, unless it shall be especially stated otherwise in the conditions of the Meeting or in the conditions of a Special Stake or Prize at such Meeting, and the expenses shall be paid by the subscribers, in proportion to the value of nominations taken by each. In the case of Produce Stakes, however, the original entries shall continue binding if the meeting is held at a later period of the season.

19. *Taking Dogs to the Slips.*—Every dog must be brought to the slips in its proper turn, without delay, under a penalty of £1. If absent for more than ten minutes (according to the report of the Slip Steward or of one of the Stewards), its opponent shall be entitled to claim the course, subject to the discretion of the Stewards, and shall in that case run a bye. If both dogs be absent at the expiration of ten minutes, the Stewards shall have power to disqualify both dogs, or to fine their owners any sum not exceeding £5 each. The nominator is answerable for his dog being put into the slips at the right time, and on the right side. No allowance shall be made for mistakes; but if the wrong dogs shall have run together in any round, and the mistake is not discovered until another round has been run, no objection can be made, and the course must stand as run. No dog shall be put into the slips for a deciding course until thirty minutes after its course in the previous round without the consent of its owner.—*See Rule* 32.

20. *Control of Dogs in Slips.*—The control of

all matters connected with slipping the greyhounds shall rest with the Stewards of a meeting. Owners or servants, after delivering their dogs into the hands of the Slipper, may follow close after them, but not so as to inconvenience the Slipper, or in any way interfere with the dogs. Neither must they holloa them on while running, under the same penalty. An owner, trainer, or attendant, after putting his dog in slips, may go forward to catch his dog, but must keep well clear of the line on the run of the hare, and must go forward on the same side as his dog is in the slips, except in such cases that the Stewards shall decide that it is advisable for both parties to go forward on the same side. Anyone infringing this rule may be fined a sum not exceeding £5 at the discretion of the Stewards. Any greyhound found to be beyond control in slips, may, by order of the Stewards, be taken out of the slips and disqualified.

21. *Greyhounds of Same Colour to Wear Collars.*—When two greyhounds drawn together are of the same colour, they shall each wear a collar and the owners shall be subject to a penalty of 10s. for non-observance of this rule. The colour of the collar shall be red for the left-hand side and white for the right-hand side of the slips. The upper dog on the card must be placed on the left hand, and the lower dog on the right hand of the slips.

22. *The Slip.*—The order to slip may be given by the Judge, or the Slip Steward, or the Stewards of a meeting may leave the slip to the sole discretion of the Slipper. The length of slip must necessarily vary with the nature of the ground, but should never be less than from three to four score yards, and must be maintained of one uniform length, as far as possible, throughout each stake.

23. *The Slipper.*—If one greyhound gets out of the slips the Slipper shall not let the other go. In any case of slips breaking, and either or both dogs getting away in consequence, the Slipper may be fined a sum not exceeding £1 at the discretion of the Steward.

24. *Decision of the Judge.*—The Judge shall be subject to the General Rules which may be established by the National Coursing Club for his guidance. He shall, on the termination of each course, immediately deliver his decision aloud, and shall not recall or reverse his decision, on any pretext whatever, after it has been declared; but no decision shall be delivered until the Judge is perfectly satisfied that the course is absolutely terminated.

25. *Principles of Judging.*—The Judge shall decide all courses upon the one uniform principle that the greyhound which does most towards killing the hare during the continuance of the course is to be declared the winner. The principle is to be carried out by estimating the value of the work done by each greyhound, as seen by the Judge, upon a balance of points according to the scale hereafter laid down, from which also are to be deducted certain specified allowances and penalties.

26. The points of the course are:—

a. Speed—which shall be estimated as one, two, or three points, according to the degree of superiority shown. [See definition below (*a*).]

b. The Go-bye.—Two points, or if gained on the outer circle, three points.

c. The Turn.—One point.

d. The Wrench.—Half a point.

e. The Kill.—Two points, or, in a descending scale, in proportion to the degree of merit displayed in that kill, which may be of no value.

f. The Trip.—One point.

DEFINITION OF POINTS.

a. In estimating the value of speed to the hare, the Judge must take into account the several forms in which it may be displayed, viz.:—

1. Where in the run up a clear lead is gained by one of the dogs, in which case one, two, or three points may be given, according to the length of lead, apart from the score for a turn or wrench. In awarding these points the Judge shall take into consideration the merit of a lead obtained by a dog which has lost ground at the start, either from being unsighted, or from a bad slip, or which has had to run the outer circle.
2. Where one greyhound leads the other so long as the hare runs straight, but loses the lead from her bending round decidedly in favour of the slower dog of her own accord, in which case the one greyhound shall score one point for the speed shown, and the other dog score one point for the first turn.
3. Under no circumstances is speed without subsequent work to be allowed to decide a course, except where great superiority is shown by one greyhound over another in a long lead to covert.

If a dog, after gaining the first six points, still keeps possession of the hare by superior speed, he shall have double the prescribed allowance for the subsequent points made before his opponent begins to score.

b. The Go-Bye is where a greyhound starts a clear length behind his opponent, and yet passes him in a straight run, and gets a clear length before him.

c. The Turn is where the hare is brought round at not less than a right angle from her previous line.

d. The Wrench is where the hare is bent from her line at less than a right angle; but where she only leaves her line to suit herself, and not from the greyhound pressing her, nothing is to be allowed.

e. The Merit of a Kill must be estimated according to whether a greyhound, by his own superior dash and skill, bears the hare; whether he picks her up through any little accidental circumstances favouring him, or whether she is turned into his mouth, as it were, by the other greyhound.

f. The Trip, or unsuccessful effort to kill, is where the hare is thrown off her legs, or where a greyhound flecks her, but cannot hold her.

27. The following allowances shall be made for accidents to a greyhound during a course; but in every case they shall only be deducted from the other dog's score:—

a. For losing ground at the start, either from being unsighted, or from a bad slip, in which case the Judge is to decide what amount of allowance is to be made, on the principle that the score of the foremost dog is not to begin until the second has had an opportunity of joining in the course, and the Judge may decide the course or declare the course to be an undecided or no course, as he may think fit.

b. Where a hare bears very decidedly in favour of one of the greyhounds, after the first or subsequent turns, in which case the next point shall not be scored by the dog unduly favoured, or only half his points allowed, according to circumstances. No greyhound shall receive any allowance for a fall or an accident, with the exception of being ridden over by the owner of the competing greyhound, or his servant, provided for by Rule 31, or when pressing his hare, in which case his opponent shall not count the next point made.

28. *Penalties*:—

a. Where a greyhound, from his own defect, refuses to follow the hare at which he is slipped, he shall lose the course.

b. Where a dog wilfully stands still in a course, or departs from directly pursuing the hare, no points subsequently made by him shall be scored; and if the points made by him up to that time be just equal to those made by his antagonist in the whole course, he shall thereby lose the course; but where one or both dogs stop with the hare in view, through inability to continue the course, it shall be decided according to the number of points gained by each dog during the whole course.

c. If a dog refuses to fence where the other fences, any points subsequently made by him are not to be scored; but if he does his best to fence, and is foiled by sticking in a meuse, the course shall end there. When the points are equal, the superior fencer shall win the course.

29. *Second Hare.*—If a second hare be started during a course, and one of the dogs follows her, the course shall end there.

30. *Greyhound Getting Loose.*—Any person allowing a greyhound to get loose, and join in a course which is being run, shall be fined £1. If the loose greyhound belong to either of the owners of the dogs engaged in the particular course, such owner shall forfeit his chance of the stake with the dog then running, unless he can prove, to the satisfaction of the Stewards, that he had not been able to get the loose greyhound taken up after running its own course. The course is not to be considered as necessarily ended when a third dog joins in.

31. *Riding Over a Greyhound.*—If any subscriber, or his servant, shall ride over his opponent's greyhound while running a course, the owner of the dog so ridden over shall (although the course be given against him) be deemed the winner of it, or shall have the option of allowing the other dog to remain and run out the stake, and in such case shall be entitled to half its winnings.

32. *No Course.*—A "no course" is when by accident or by the shortness of the course the dogs are not tried together, and if one be then drawn the other must run a bye, unless the Judge, on being appealed to, shall decide that he has done enough work to be exempted from it. An undecided course is where the Judge considers the merits of the dogs equal, and if either is then drawn, the other cannot be required to run a bye; but the owners must at the time declare which dog remains in. (*See Rule* 34.) The Judge shall signify the distinction between a "no course" and an "undecided" by taking off his hat in the latter case only. After an undecided or no course, if the dogs before being taken up get on another or the same hare, the Judge must follow, and shall decide in favour of one if he considers that there has been a sufficient trial to justify his doing so. A "no course," or an "undecided" may be run off immediately, if claimed on behalf of both dogs before the next brace are put into the slips, or in case of "no course," if so ordered by the Judge, otherwise it shall be run again after the two next courses, unless it stand over till the next morning, when it shall be the first course run; if it is the last course of the day, fifteen minutes shall be allowed after both dogs are taken up.

33. *Explanation by Judge.*—The Judge shall render an explanation of any decision to the Stewards of the meeting if required, through them, before the third succeeding course, by the owner, or nominator, or representative of the owner or nominator of either of the greyhounds engaged in the course. The Stewards shall, if requested to do so, express their opinion whether the explanation is satisfactory or not, and their opinion in writing may be asked for and published afterwards, but the decision of the Judge, once given, shall not be reversed for any cause.

34. *Withdrawal of a Dog.*—If a dog be withdrawn from any stake on the field, its owner, or someone having his authority, must at once give notice to the Secretary or Flag or Slip Steward. If the dog belongs to either of these officials, the notice must be given to the other. When after a no course or an undecided one of the greyhounds has been officially drawn, and the dogs are again, by mistake, put into the slips and run a course, the arrangements come to shall stand, whatever the Judge's decision may be, and all bets on the course shall be void.

35. *Impugning Judge.*—If any subscriber, owner, or any other person, proved to be interested, openly impugns the decision of the Judge on the ground, except by a complaint to the Stewards, according to Rule 33, he shall forfeit not more than £5, nor less than £2, at the discretion of the Stewards.

36. *Stakes not Run Out.*—When two greyhounds remain in for the deciding course, the stakes shall be considered divided if they belong to the same owner, or to confederates, and also if the owner of one of the two dogs induces the owner of the other to draw him for any payment or consideration; but if one of the two be drawn without payment or consideration, from lameness, or from any cause clearly affecting his chance of winning, the other may be declared the winner. the facts of the case being clearly proved to the satisfaction of the Stewards. The same rule shall apply when more than two dogs remain in at the end of a stake which is not run out; and in case of a division between three or more dogs, of which two or more belong to the same owner, these latter shall be held to take equal shares of the total amount received by their owner in a division. When there is a compulsory division, all greyhounds remaining in the class that is being run, even where one is entitled to a bye, shall take equal shares. The terms of any arrangement to divide winnings, and the amount of any money given to induce the owner of a dog to draw him, must be declared to the Secretary.

37. *Winners of Stakes Running Together.*—If two or more greyhounds shall each win a stake, and have to run together for a final prize or challenge cup, should they not have run an equal number of ties in their respective stakes, the greyhound which has run the smaller number of courses must run a bye, or byes, to put itself upon an equality in this respect with its opponent.

38.—*Objections.*—An objection to a greyhound may be made to any one of the Stewards of a meeting at any time before the stakes are paid over, upon the objector lodging in the hands of such Steward, or the Secretary, the sum of £5, which shall be forfeited if the objection proves frivolous, or if he shall not bring the case before the next meeting of the National Coursing Club, or give notice to the Stewards previous thereto of his intention to withdraw the objection. The owner of the greyhound objected to must deposit equally the sum of £5, and prove the correctness of his entry. Expenses in consequence of an objection shall be borne as the National Coursing Club may direct. Should an objection be made which cannot at the time be substantiated or disproved, the greyhound may be allowed to run under protest, the Stewards retaining the winnings until the objection has been withdrawn, or heard and decided. If the greyhound objected to be disqualified, the amount to which he would otherwise have been entitled shall be divided equally among the dogs beaten by him; and if a piece of plate or prize has been added, and won by him, only the dogs which he beat in the several rounds shall have a right to contend for it.

COURSING. (From an old print.)

39. *Defaulters.*—No person shall be allowed to enter or run a greyhound in his own or any other person's name, or attend any coursing meeting, or the draw, dinner, or calling over of the card, of any meeting, to whom Rule 41, as hereinafter, has been applied, or who is a defaulter for either stakes, forfeits, or bets, or for money due under an arrangement for a division of winnings, or for penalties regularly imposed for the infraction of Rules by the Stewards of any meeting, or for any payment required by a decision of the National Coursing Club, or for subscriptions due to any club entitled to have representatives in the National Coursing Club. As regards bets, however, this rule shall only apply when a complaint is lodged with the Secretary of the National Coursing Club within six months after the bet becomes due. On receipt of such complaint the Secretary shall give notice of the claim to the person against whom it is made, with a copy of this rule, and if he should not pay the bet, or appear before the next meeting of the National Coursing Club, and resist the claim successfully, he shall be considered a defaulter.

40. *Judge or Slipper Interested.*—If a Judge or Slipper be in any way interested in the winnings of a greyhound or greyhounds, the owner and nominator in each case, unless they can prove satisfactorily that such interest was without their cognisance, shall forfeit all claim to the winnings and the dog shall be disqualified; and if any nominator or owner of greyhounds shall give, offer, or lend money, or anything of value to any Judge or Slipper, such owner or nominator shall not be allowed to run dogs in his own or any other person's name during any subsequent period that the National Coursing Club may decide upon.

41. *Discreditable Conduct.*—Any person who is proved to the satisfaction of the National Coursing Club to have been guilty of any fraudulent or discreditable conduct in connection with coursing, or any other recognised sport, may, in addition to any pecuniary penalty to which he may be

liable, be declared incapable of running or entering a greyhound in his own or any other person's name during any subsequent period that the National Coursing Club may decide upon; and any dogs under his care, training, management, or superintendence, shall be disqualified during such subsequent period.

42. *Bets.*—All bets upon an undecided course shall stand, unless one of the greyhounds be drawn. All bets upon a dog running further than another in the stake shall be p.p., whatever accident may happen. Bets upon a deciding, as upon every other course, are off if the course is not run. Long odds bets shall be void when made after the draw, unless the greyhound the bet refers to shall run one course in the Stake, other than a bye, after the bet is made. In the case of a meeting, or of a coursing prize, where the nominations are not void in consequence of postponement, all long odds bets made before the first draw shall hold good, but long odds bets made after any draw, except the draw under which the stake is run, shall be void.

43. *Bets on Stakes Divided.*—Where money has been laid against a dog winning a stake, and he divides it, the two sums must be put together and divided in the same proportion as the value of the stakes.

Inclosures.—The loss of so many estates to coursing through the operation of the "Ground Game Act" led to the substitution of a modified system of sport in the shape of inclosures—that is to say, a piece of ground was fenced round, and a thin cover formed at each end, from which imprisoned hares were coursed from one end to the other by a brace of greyhounds. The first of these inclosures was at Plumpton, in Sussex, then followed Gosforth Park, near Newcastle-on-Tyne, Four Oaks Park, near Birmingham, and Haydock Park, near Liverpool, not to omit the Kempton Park racecourse. This drawing-room style of coursing was all the rage for a few years, and large sums were added to the entry money, whilst, as speed to the hare was the chief *desideratum*, people began to breed greyhounds accordingly, to the certain deterioration of the pure type of animal. Added to this, dishonest practices became too prevalent, which in the old-fashioned sport had been hitherto almost unknown. The end eventually arrived, for the true sportsman shunned the new-fangled invention and returned to his old love, with the result that every one of the afore-mentioned inclosures is now well-nigh forgotten. In Ireland there were at one time three or four inclosures, under responsible control, all of which are now extinct; and in Scotland artificial coursing is unknown.

The Waterloo Cup.—The Waterloo Cup has long been the chief prize of the coursing year, ranking, indeed, with the Derby of the Turf, and it has been copied in other countries where the sport has been introduced. Strange to say, its origin and beginnings were of the humblest character, and its promoter never could have foreseen its ultimate importance, though he lived to see the event one that it was the ambition of every courser to win. It was in the year 1836 that the proprietor of the Waterloo Hotel in Liverpool improvised an eight-dog stake, which he styled the Waterloo Cup, and it was run for on the Altcar estate of Lord Sefton, the home of the famous Altcar Coursing Club before referred to, and ever since it has been decided on the same ground. Appropriately, the founder of the first Waterloo Cup was the winner, and, better still, he achieved the distinction by nominating a greyhound, belonging to Lord Molyneux, called *Milanie*. Lord Molyneux was father of the late Lord Sefton, so long connected with coursing. The year following its foundation the Waterloo Cup was increased to sixteen runners, and the year after to thirty-two, at which limit it remained till 1857, when it was made a sixty-four dog stake, and continues so to the present day. The entry money is £25 per greyhound, and the nominations, giving the right of competing, are usually arranged by a committee of members of the Altcar Club at the November meeting of that institution. The running takes place in February, when frost does not interfere, and, with a Waterloo Purse and Plate for the thirty-two and sixteen greyhounds beaten in the first and second rounds of the Cup respectively, the meeting is comfortably completed in three days. The stake partakes of an international character, though England, with the preponderance in nominations over Ireland and Scotland, necessarily possesses the best chances of winning the coveted prize, which latterly has been increased in value by Lord Sefton's addition of a yearly trophy. Since 1857, and up to 1909, England has provided forty-two winners, Scotland six, and Ireland five. Since it was increased to a sixty-four dog stake, amongst winners of the Waterloo Cup no fewer than twenty-three of the forty greyhounds were "named"—that is to say, the owners were not the nominators, although the most particularly interested parties. Singular features of the Waterloo Cup are noted in connection with two celebrated greyhounds—namely, Lord Lurgan's *Master M'Grath* and the late Colonel North's *Fullerton*, the former of whom was victor on three occasions, with a break of a year, whilst the latter actually divided with a kennel companion and then won outright three years in succession. The wonderful merit of these performances is strikingly apparent when it is seen that a greyhound has to defeat six opponents before it can be proclaimed the winner of a Waterloo Cup, not to omit the chance of getting extra courses in the shape of "undecideds." *Coomassie,* one of the smallest greyhounds ever known, was the winner in two successive years; but previously, when the stake was a "thirty-two," entailing five courses for the winner, *Cerito* was three times successful, with a break between the first and second occasions.

THE TURN.

WINNERS OF THE WATERLOO CUP FROM 1900.

1900.—Mr. J. H. Bibby's *Fearless Footsteps.*
1901.—Mr. J. H. Bibby's *Fearless Footsteps.*
1902.—Mr. G. F. Fawcett's *Farndon Ferry.*
1903.—Mr. J. H. Bibby's *Father Flint.*
1904.—Mr. G. Darlinson's *Homfray.*
1905.—Mr. W. H. Pawson's *Pistol II.*
1906.—Mr. H. Hardy's *Hoprend.*
1907.—Sir. R. W. Buchanan-Jardine's *Long Span.*
1908.—Mr. E. Hulton's *Hollow Eve.*
1909.—Messrs. J. E. and S. M. Dennis's *Dendraspis.*
1910.—Mr. S. Hill-Wood's *Heavy Weapon.*

The Colonies.—Here Coursing was introduced with more or less success. In Australasia (covering the great island continent, Tasmania and New Zealand), the sport was at one time exceedingly popular, the most influential men entering into it, regardless of expense, judging from the prices they paid for imported greyhounds. Of late years, however, interest in the pastime has declined, and the strongest and most influential clubs of fifteen or twenty years ago have ceased to exist; in fact, in Australia itself, coursing is now mainly confined to the country districts. To South Australia must be given the credit of introducing the pastime to the "Greater Britain of the South." It was in the year 1867 that a few sportsmen were hunting kangaroo with greyhounds, when a wallaby (a smaller species of the marsupial) jumped up, and a very fine course resulted. A new arrival from England at once suggested the formation of a coursing club, which proved the forerunner of coursing as practised in this country, especially as the English hare had about that time been introduced successfully—too much so, as eventually turned out, for the farmer, since it breeds three or four times a year, with as many as four and five in a litter. Hares, in fact, in some of the colonies have been for years legally classed as "vermin." Emulating the old country, Waterloo Cups were started in South Australia, New South Wales, Victoria, and New Zealand. That in Victoria was for years conducted on precisely the same lines as the original one in England, the stake and number of greyhounds being identical, and imported English dogs frequently were victorious, whilst the late Mr. George Warwick, the leading judge of his time, was engaged for a season. In addition, National Coursing Clubs were founded, and the greyhound registration system followed.

The Continent.—Some years ago, coursing, according to the English system, was introduced into Russia by the Grand Duke Michael, Prince and Princess Alexander Scherbatoff, and Count Stroganoff, the two latter of whom kept up kennels in England, and joined the principal clubs, and Count Stroganoff won the Waterloo Cup in 1894 with *Texture,* an English-bred greyhound that he had purchased only a few weeks previously in London for 110 guineas. This is one of the most striking exemplifications of the "luck" that is popularly supposed to surround Coursing. The Coursing in Russia took place near St. Petersburg and Moscow, and the principal event was the Waterloo Cup, the peculiarity of which was the circumstance that most of the nominators ran several greyhounds in their own individual names, and thus frequently "swept the board." The Russian Waterloo Cup was generally won by English-bred greyhounds, and an English judge and slipper were always engaged. Of late years the pastime has fallen off in popularity.

Coursing was experimented in France about twenty years ago, on the inclosed system; but after one or two successful seasons it quietly died away, for reasons to which it is unnecessary to allude. A few enthusiasts during recent years started coursing in Hungary, but lack of recruits hampered their efforts from the outset.

America.—In the United States at one time Coursing appeared to have taken firm root, the one drawback being the many hundred miles separating the great centres of population from the prairie land in the west, where the running took place. The sport in recent years, however, has been rarely heard of, and a series of scandals which originated in inclosures in San Francisco not only brought Coursing into disfavour, but stopped the steady importation of English greyhounds. The National Greyhound Club's rules were almost identical with the English version; there was also a "Greyhound Stud Book," not to omit a Waterloo Cup. On the prairies the animal known as the jack rabbit abounds, and so game is readily at hand—in fact, it in every way tests to the utmost the qualities of a first-class greyhound.

The Judge.—A "good judge" is the *sine qua non* of a well-organised coursing meeting; and ever since the sporting papers commenced giving full detailed reports, their representatives have never hesitated to criticise what in their opinions was an error on the part of the official on horseback, or as in some countries, notably Lytham and Southport, on the ladder. In the last century, when matches between a brace of greyhounds were in vogue, the owner of each chose an umpire, and these two in their turn appointed a referee, in case of a difference of opinion. One of the earliest and best known judges of the last century was Mr. William Nightingale, whose heart and soul were in his work from the moment a couple of greyhounds were slipped. He was enthusiastic to a degree when he spotted a good dog, and equally the contrary with one of the opposite stamp. Following him was Mr. Anthony Dalzell, and then Mr. George Warwick, who in the zenith of his career once judged 105 days in a single season, frequently having to travel from the extreme south to Scotland, and *vice versa,* so as to be on the ground the following morning by nine o'clock or often earlier. Some big days, too, he accomplished, his record being 101 courses in a single day at Lurgan. If anything, Mr. Warwick's feats were excelled by Mr. James Hedley, the leading judge of his day, a born courser, so to speak, as his father was a keen follower of the sport on the Borders, and was wont to take the future judge out to meetings when quite a small boy. Suffice it to say that the nominators of no fewer than twenty-four Waterloo Cups elected Mr. Hedley their judge, a striking testimony to his wonderful ability and unquestionable honesty. On his retirement, about three years preceding his death, the coursing community presented him with a testimonial amounting to more than £2,000.

Officials. — Indispensable officials to coursing meetings are the **slipper,** the **flag steward,** and the **slip steward.** The first named must not only be an adept at handling the leash, so as to start each dog on equal terms, but he must likewise be a smart pedestrian (running as well as walking). The late Tom Raper (a Yorkshireman, and father of the present show ring judge of that name), was undoubtedly the most capable of his time, and since his day he has not been approached by the later generation. The flag steward's duty is to signal the judge's decision promptly, and, of course, correctly, as a single error on his part creates no end of confusion. Hence it is better that he should be an expert in the sport, and keep the competing greyhounds in his eye as long as they remain in sight. The slip steward also is a responsible official, it being his duty to see that the greyhounds are brought to slips in proper time, and in their proper turn.

W. F. Lamonby ("Skiddaw").

GREYHOUND CELEBRITIES.—In treating of celebrities among greyhounds, it is somewhat strange that we should find ourselves restricted to the last hundred years or so for any authentic information. For a record of names, not to speak of performances, we find ourselves at a loss till we come to the very end of the eighteenth century, and even then the details are but meagre till we are well advanced into last century. It is true that quite at the close of the eighteenth century Mr. Mundy had a dog called Wonder, but this must have been a case of adult baptism, and the owner cannot have had the fear of the fines and penalties exacted by the keeper of the stud-book before his eyes. The dog was indeed a wonderful performer, and his blood in great fulness runs in all strains of the successful dogs of the present day. He was a grandson of a bitch belonging to King George III. Royalty is also still represented as widely by the descendants of a dog which belonged to Princess Charlotte. They have in course of time combined with those of her royal grandfather's dogs. It is believed that the blood of the Archbishop of York's black and white dog runs in the strain of the famous Bab at the Bowster, the best dog of modern days: a veritable mother in Israel, for there are probably few first-class dogs who cannot boast of being her descendants.

The first name which is handed down to fame is Lord Orford's Czarina. She was a wonderful bitch. She won forty-seven matches. Those were the days of match-making, when each owner vied in friendly rivalry with others of the same club. Stakes, as we have them, were scarcely known. This Czarina never was beaten. Considering the length of courses in the old Swaffham Club, to which Lord Orford belonged, this was an exploit which means more than catches the eye at first sight. It is stated that she never bred till she was thirteen years old: a statement which savours of the mythical, for it is doubtful whether any greyhound has ever bred at that age in modern days. Certainly they have not bred anything good, whereas her progeny, Claret and Vengeance, were at the top of the tree. Lord Orford rode out to see her win her last match. The excitement caused by her victory was too much for him: he dropped off his pony and died. This happened in 1791.

Her grandson Snowball was even more celebrated. He found his "vates sacer" in Sir Walter Scott, a genuine sportsman, who entered heartily into the mysteries of a course, and from his famous lines ("'Twas when fleet Snowball's head was waxen grey") we can picture to ourselves the turns and doubles and wrenches, the struggle to reach the covert, the effort to take to the hill, and the fatal gap. Apart from this performance of Snowball in his old age, we have no record of his triumphs, but it is true, as Scott has it, that his race was triumphant in England and Scotland "o'er each meaner stamp." The date of his birth was about 1796. Mention has already been made of Wonder, who was born about two years later. He, possibly, was a dog of still greater excellence, but he lacked the necessary chronicler. However, he established the fame of "Mr. Mundy's breed." In those days each owner of a kennel jealously guarded the secrets of his harem, and all that transpired was that a dog was of such or such a breed. Mr. Mundy, Mr. Topham, Lord Stradbroke, Lord Rivers, Mr. Lloyd, Mr. Swan. Mr. Best, Mr. Hassall, Mr. Swinfen, and many others established a name for their blood, rather than for any particular dog; but we can trace the union of the Snowball with the Wonder strains with excellent effect in Moorcock, Romp, Tiger, Tippoo, and a younger Snowball. Mr. Hassall's Harold, one of the unbeaten heroes, was of this strain. About this time Mr. Good-

GOING TO A MEETING. (From an old print.)

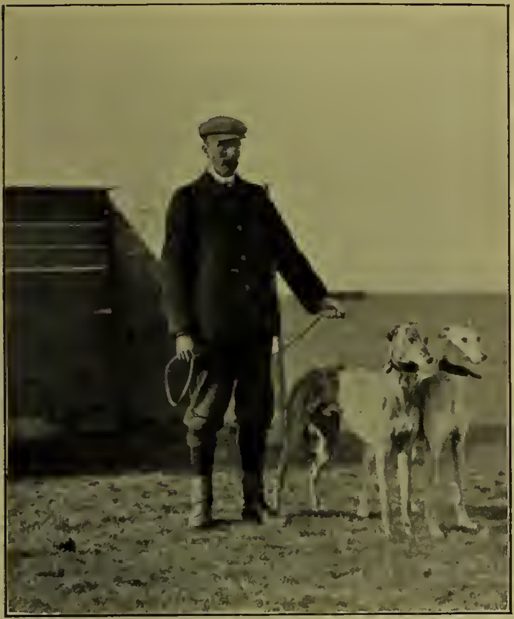
lake's kennel was greatly in the ascendant, and its bright particular star was Gohanna. Mr. Goodlake was an enthusiastic courser, and it was possibly from a pardonable desire to embalm the "glories" of his breed that he undertook the compilation of the first stud-book, from which we now draw almost our only information. After a few years he evidently found the labour too great, and owners were so jealous of their breed that many years afterwards Thacker apologised for mistakes he had made by saying he would not venture on the impertinence of writing to the owners for information. The stud-book was discontinued, and a blank of about ten years follows, when Thacker started one on a larger scale: a work which under various forms has been carried on to the present day. Waterloo was the hero at that time. He was a dog of a peculiar colour, which varied so that sometimes he was described as dun and white, sometimes fawn and white, and sometimes brindled and white. Lord Eglinton bred him and challenged All England with him. Mr. Goodlake took up the challenge with his very good dog Gracchus. The match was run off at Ashdown Park, where the hares were famous for their stoutness, and Waterloo won easily. In connection with his colour, in his letter of challenge, Lord Eglinton names his dog Waterloo, but excuses himself from giving his colour because of its well-known peculiarity. The blood of Waterloo still runs in the great family of Beacon and Scotland Yet, as well as in those which claim Fusilier as their ancestor.

With reference to this challenge, it may be remarked that more than once there was a challenge stake run off at Ashdown between North and South. Lord Sefton, Mr. Graham, Mr. Borron, the Listers, Mr. John Jardine were the chief representatives of the North, while Mr. Randell generalled the South, and was ever in the front himself. "Stonehenge," in his book on *The Greyhound,* gives an account of several breeds—the Newmarket, Wiltshire, Lancashire, Scotch, and Yorkshire varieties—and no doubt in those days there was a distinct difference owing to the different style of coursing. At Newmarket and Swaffham and in Wiltshire, courses of from two to four miles were not rare. On the plains of Altcar a few hundred yards was the limit. In Scotland the running was more on the hill than in the vale, while in the northern counties the country was inclosed, and fallow or growing corn more often met with than grass.

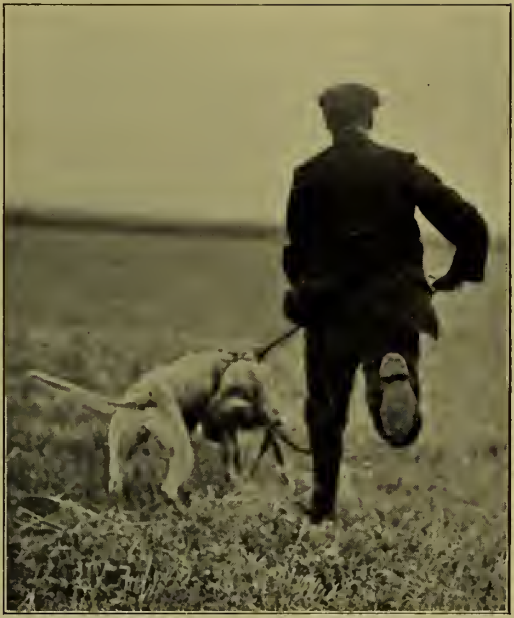
The want of communication and the jealousy of rival breeders helped the great law of the survival of the fittest. But just at this time Captain Daintree placed his grand dog, King Cob, at the service of the public. He was essentially a Newmarket dog. Strange to say, Lord Stradbroke, who was a great supporter of Newmarket coursing, considered that the use of King Cob had poisoned his breed, and was glad to get rid of the produce. In this way Mr. Sharpe, of Hoddom, obtained his celebrated Queen of the May, and was rewarded by winning the Waterloo Cup with her son Hughie Graham. Soon after Mr. Sharpe had got her, Will Nightingale was judging in Scotland. He was singing the praises of King Cob's stock, and someone told him that there was a King Cob puppy entered at the meeting. He laughed at the idea of a King Cob puppy being found so far north, but the moment he saw her run he called out, "That's a King Cob." The enterprise of Mr. James Hedley, the father of the late famous judge, took Matilda Gillespie to King Cob from the border of Northumberland, and was rewarded by The Tollwife, who laid the foundation of Mr. John Jardine's unequalled successes. These two daughters of King Cob now live in the almost universal progeny of Bab at the Bowster, and that distinguished family of Ptarmigan and Gallant Foe, which was the glory of Northumberland and the champion race at Altcar. A year or two afterwards Sir James Boswell bred Jason, who was very successful both in the field and at the stud, notably with his son Vraye Foy, who again, through Egypt and Lopez, is represented by most of the first-class dogs of the day, another line of Jason being found in Herschel's pedigree. This, with The Czar, is characterised by "Stonehenge" as the "bulldog cross"; but Captain Daintree held that there was a bulldog strain also in King Cob, which makes it common to all greyhounds. About the same time appeared Mr. Sharpe's Monarch, whose dam was bought from a tramp. The bitch must have shown great quality, and the purchaser must have been a rare good judge, for her son has left his mark on the stud-book to the present day.

And now we come to sound ground, for we have the bead roll of the winners of the Waterloo Cup to guide us and tell us something of the performances of those dogs whose fame still lives in coursing annals. And it is worthy of remark that though the Waterloo Cup began in a very small way by being only an eight-dog stake, and in its second year a sixteen-dog stake, and in its third, one for thirty-two dogs, yet

THE WATERLOO CUP

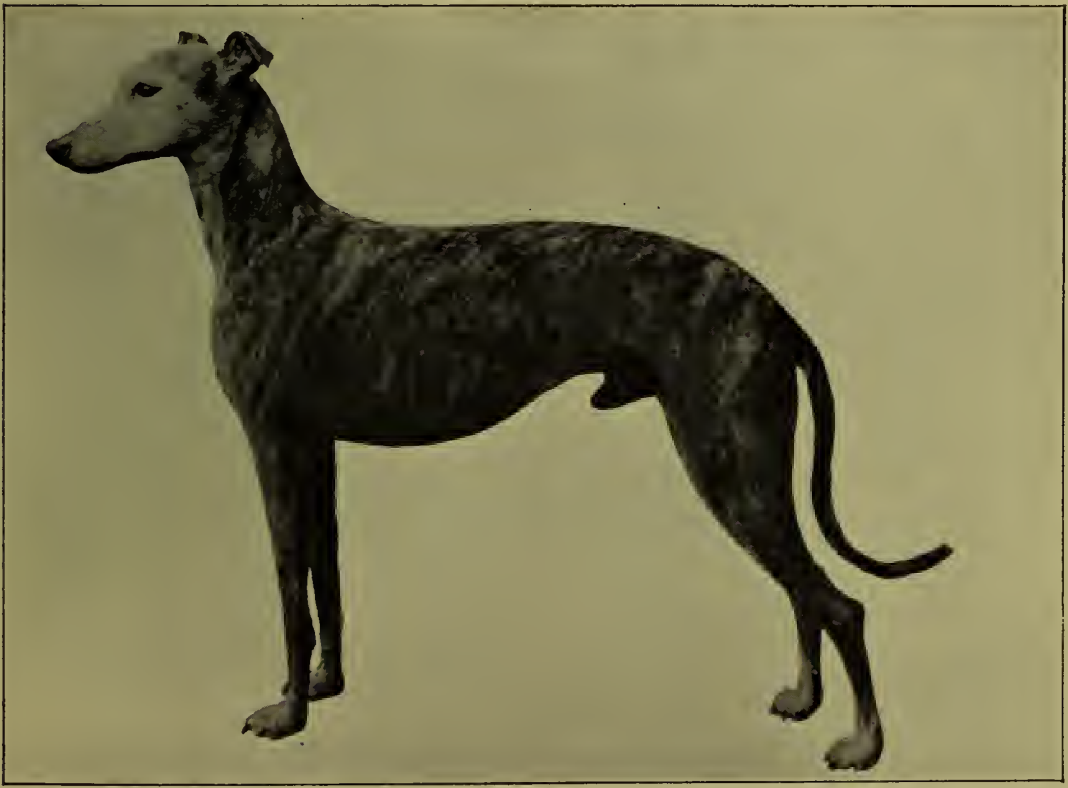


Slipper with Dogs.



Slipping a Brace.

THE CHAMPION.



Fullerton, Divided 1889, Winner 1890, 1891, 1892.

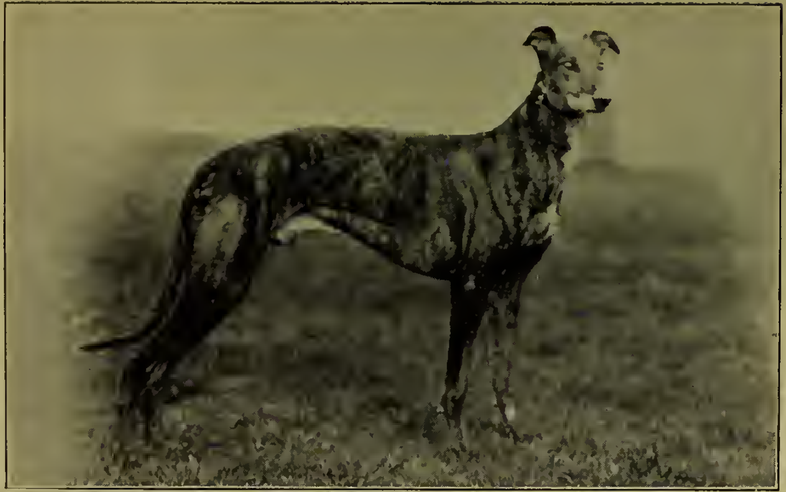
WINNERS OF THE WATERLOO CUP, 1898—1906

Wild Wight, Winner 1898.

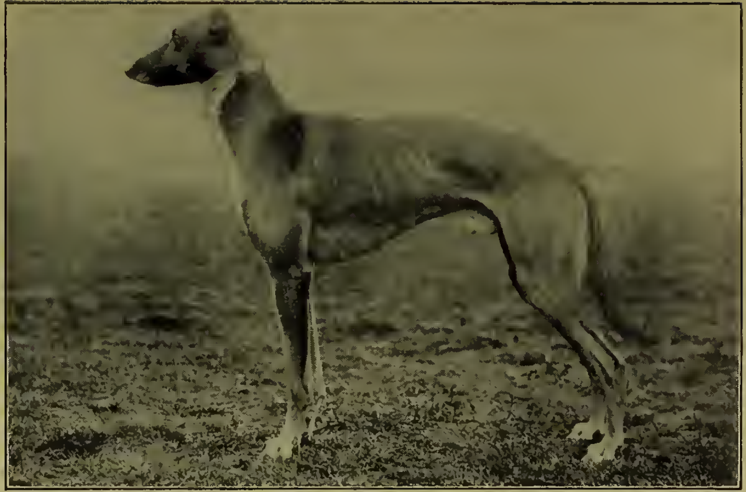
Black Fury, Winner 1899.

Fearless Footsteps Winner 1900, 1901.

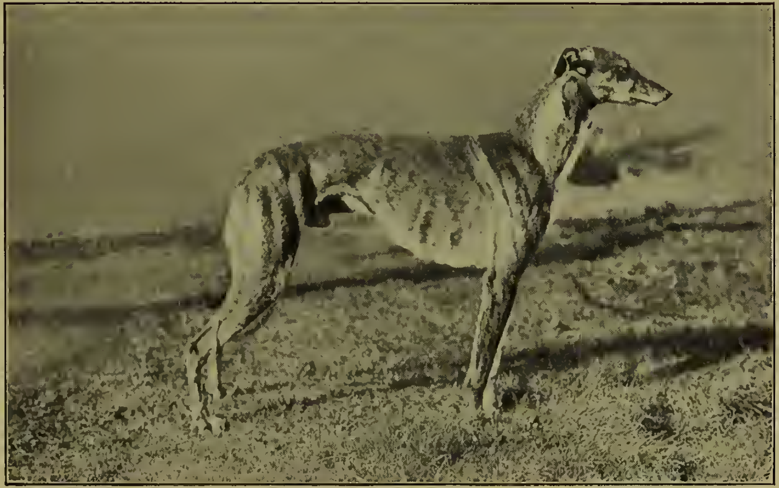
Farndon Ferry, Winner 1902.



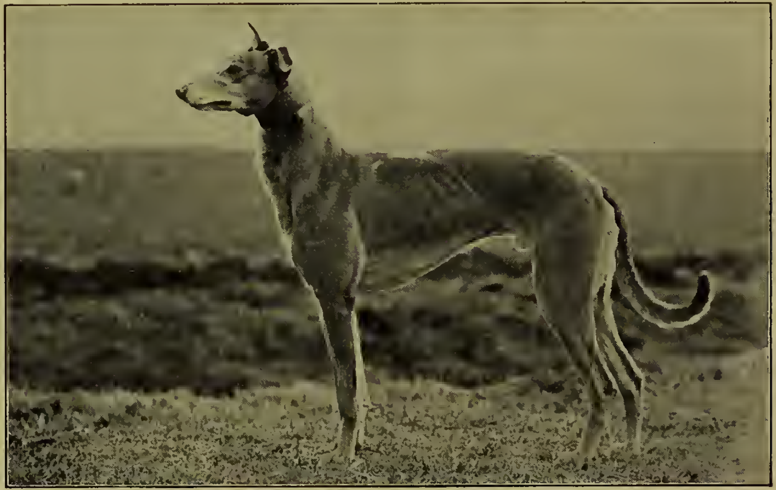
FATHER FLINT, WINNER 1903.



HOMFRAY, WINNER 1904.



PISTOL II, WINNER 1905.



HOPREND, WINNER 1906.

Two Typical Courses.

the second and third winners and probably the first are still successful in their progeny, as they themselves were in their flesh, not only over the plains of Altcar, but all over the coursing world. The strains of Blue Bugle and of Emperor are still among the most cherished, sometimes perhaps unconsciously, by breeders of the present day. Emperor, indeed, failed himself in the deciding course, being beaten by a kennel companion, but two of his sons revenged his defeat, and his other successful descendants are legion. As Lord Sefton was the founder of the Altcar Club, as he brought in the best blood from North and South to improve the native greyhounds, it was but fitting and fortunate, not only that his bitch Milanie should head the list, but that in Senate we should have one of the most valuable lines in every modern pedigree. It is not without reason that the term "fortunate" is used. His father and mother were as well bred as could be, but perhaps not coming up to the Lancashire ideal, that ideal being a sprinter, the trainer was about to put them down, when the bitch came in season, and they were respited till the puppies were weaned. The produce was Oliver Twist, Senate, and Eastham. Contemporary with Senate in the North was Figaro at Newmarket, a son of King Cob; somewhat unfortunate himself, as was his sire, but the father of a host of dogs of the finest stamp. Among them were Mocking Bird, one of the handsomest bitches seen, Bedlamite, and Boreas. It may be noted here that all the progeny of Bedlamite were without exception black, while those of Boreas were of all colours. Weapon, Lablanche, Gamechicken, Hurkaru, Music Master, and a host of others, including sisters of Mocking Bird, still testify to the permanent value of the merits of Figaro. Bedlamite was a small dog of 58 lb. weight, but full of quality; his stoutness and cleverness were undeniable. He naturally became the favourite sire, especially in the South; but his blood survives to-day chiefly through Hopmarket, a daughter of the famous Cerito, and through Randell's wonderful bitch Riot, who was the grandmother of another public favourite in Mr. Haywood's Rebe. Riot was mated with the best dogs of the day, but her most successful son was Regan, the sire of Rebe by Barrator, himself a most extraordinary dog. Though he failed to have his name inscribed in the roll of successful dogs in the Waterloo contest, yet his style pleased the eye of all good judges; but what attracted most notice was the complete command which his master had of him. At a word he would lie down and take not the slightest notice of a hare passing close to him, or he would play at leapfrog with his master, or he would fly at and worry a man. Bedlamite's rival in the South was David, doubly a descendant of King Cob (but not through Figaro), and a grandson of Senate. It may be the combination of the Northern with the Southern race which eventually gave his family the pre-eminence; be that as it may, there is scarcely a pedigree of note which has not the name of David in it. The union of Bedlamite, through The Brewer, with Glimpse at Glory, a daughter of David, produced Gaudy Poll and a number of winners of the first class in the South.

LONG SPAN, WINNER OF THE WATERLOO CUP, 1907.

HALLOW EVE, WINNER OF THE WATERLOO CUP, 1908.

Bedlamite was put to Flounce and produced Jacobite, probably the fastest dog of his day, but a very wide worker. Old coursers still talk of Jacobite, and of Belligerent, a grandson of Weapon, a few years later as showing most wonderful speed.

But while the line of Mr. Brundrit's dog has died out, that of Jacobite survives in the numerous families of Cardinal York, Picton, Forster's Meg, whose son Kingwater almost rivalled his sire in pace, and the great family of Lord Haddington's, which at one time swept the board.

The next which attracts attention is Cerito, one who ranks with Master M'Grath and Fullerton as thrice winner of the Waterloo Cup. In her case the Cup was only for thirty-two dogs. But when she was beaten in her second attempt, she succeeded in running up for the Altcar Stakes. She left one descendant, Hopmarket by Bedlamite. The family of Hopmarket by her union with Sharpe's fast dog Larriston, promised to carry all before them, but it has nearly dropped out of the front rank, the produce of Bit of Fashion, a most successful bitch, being the most conspicuous; but with the physical failure of Fullerton, the comparative failure of Young Fullerton, and the more complete failure of the rest, this family seems on the verge of extinction. It is worthy of remark that these three great winners, Cerito, Master M'Grath, and Fullerton, have all been more or less failures at the stud; while those who stand next in rank, Coomassie and Miss Glendyne, as dual winners, have met with no more success. Sackcloth, who followed Cerito, deserves more than a passing notice. Not only did he belong to Lord Sefton, but he had been to Amesbury, where he had won three courses in the beginning of February; then to Ashdown, where he won a fourteen-dog stake three weeks later, and the week after he won the Waterloo Cup; truly a magnificent performance and an undeniable proof of stoutness. The judgment of Lord Haddington, then Lord Binning, in breeding from him was properly rewarded in giving him a succession of winners, whose performances it was a pleasure to watch. Through Sackcloth and through Patent the line of Foremost, once a successful rival at the stud to Figaro, chiefly now exists; but the success of Greentick, their greatest descendant, spreads it far and wide. Larriston, a very fast dog by Mr. Sharpe's famous Liddesdale, ran up to him. Larriston was successfully mated with Hopmarket, and also with Mr. Hayward's Hopbine. The produce of the latter union was Rackety Hoppicker, the founder of Haywood's great successes, a strain not likely to die out, as it permeates all breeds.

And now we must come to the two last of the Waterloo Cups limited to thirty-two dogs, when Judge beat Scotland Yet, and Protest beat Judge, and Blackcloud won the Altcar Stakes—a collection of great names. No finer dog than Judge ever won the Waterloo Cup, and it is pleasing to remember that he won it for Sir Thomas Brocklebank, the best, the most respected, and almost the oldest supporter of the sport. Judge was most successful at the stud, and the cross between Canaradzo, a son of Scotland Yet, the runner-up, and daughters of Judge was as much sought after as that between Herschel and Greentick in the present day. Scotland Yet was the sweetest of runners. She was a great favourite of Will Nightingale. It is said that in her last course he took off his cap (he could not see her beaten), and whispered to her trainer: "Draw her, Jimmy, draw her; she is not running to her form." She was of a beautiful shape, white, with a small patch of brindle. Most of her family took after her and introduced the white and brindled colour, which was for a long time the winning colour in the North.

The coming of this family was a distinct era in the history of the greyhound. They all had the same style of going; starting slowly, they stole along with the smoothest of action, and as they neared the hare they shot out and pressed it from the first with determined efforts to kill, but never throwing themselves out: a very winning and a very pretty style. Their stoutness was not a strong point, though Coorooran, one of the family, was noted for his lasting qualities in the old Dirleton country, where the hares were of the strongest, and a three-legged hare was known to try the mettle of the best of them. They were good killers, and so, as a rule, made short courses. The family consisted of Canaradzo, who won the Waterloo Cup and was sire of King Death, who also won it and the Plate as well, Coorooran, Seafoam, Bugle, Dalgig, and Canopy, besides others who bred nothing of consequence. Seafoam was the sire of Lobelia, and Bugle the grandsire of Seacove, also Waterloo Cup winners. King Death was the sire of Cock Robin, who ran up to Master M'Grath, and of Chameleon, who was thought by some to have been the best bitch of modern days over the Altcar ground. Her two long undecideds with Gone, in Peasant Boy's second year, were recognised as an abuse of the power of the judge, and led to a change in that department. Cock Robin was grandsire of Misterton, and Chameleon the dam of Commerce, who had the worst of the scrimmage for the Waterloo Cup of 1879. Canaradzo is also represented in the descendants of Ptarmigan;

Mr. Fawcett's splendid family from Fair Future have several strains of Canaradzo apart from one of King Death; Herschel has a line of Coorooran, and probably there are few winners who have not some of the family blood in them through Contango as well as other lines.

DENDRASPIS, WINNER OF THE WATERLOO CUP, 1909.

We have somewhat outrun our subject in treating of this great family. In 1857 the Waterloo Cup became a sixty-four dog stake. King Lear, a very elegant white dog with a little fawn about him, won it, and David ran up for the Purse. King Lear was scarcely a success at the stud; still, he was the ancestor of Muriel, and still lives in the stout-hearted breed of Sir Robert Jardine. Of David it is scarcely necessary to say much. In the South his stock carried all before them; in the North, if his puppies were not so successful in the first generation, they have happily combined with the strains of the country, and he takes rank with Canaradzo, Judge, Figaro, and their congeners as indispensable in a pedigree of the first class. Patent was probably his most successful son in the field and also at the stud, but now he is not so often met with as other sons, though in fact his blood appears in the pedigree of Greentick, whose great grandam Merrywife was by David his sire, out of Henrietta by Regan out of Lady Clara his dam, the grand lines of Barrator and Riot being thus thrown in.

The following years seem to have produced no dogs which live in our memory, though Lady Watford, the grandmother of both Brigadier and Master M'Grath, and Java the grandam of Bed of Stone and Gaudy Poll, were among the unsuccessful competitors for the Waterloo Cup. We then come to the era of Canaradzo and his family, the praises of which have already been sung, soon followed by the success of his son, King Death. That sterling good bitch, Rebe, showed her quality by twice running up for the Cup and dividing the Purse; foreshadowing the even more excellent performance of Bed of Stone in winning successively the Purse, the Plate, and the Cup. And now comes a time when, for a few years, the form of the greyhound of the day was absolutely of the highest class. We will take the Waterloo contest of 1867. In the last eight of that year we find Master M'Grath, Lobelia, Brigade, Cock Robin, Charming May, and Patent Lever, Bab at the Bowster having been beaten by Lobelia in the preceding round after an undecided. Each of these was equal to winning the Cup with the necessary luck. The next year the names of Bacchante and Cataclysm and that of Lady Lyons, the sensational conqueror of Master M'Grath, swell the list, and this period, this Augustan age, seems to end in a display of rockets in the shape of Bendimere, Cavalier, Waywarden, Cyclone, and that extraordinary bitch, Bed of Stone, who, through her one solitary son Bedfellow, has stamped successive generations with her hall-mark. Chameleon in the following year kept up the reputation of her parents King Death and Chloe, both being winners of the Cup in their day; and the name of Smuggler appears, whose excellence, not appreciated at that time by Warwick, reappeared as a halo of glory around that princess of her kind, the charming Miss Glendyne. Still the quality of the competitors seems to have died away from that time. Here and there a name appears which we mention with the greatest respect, as, for instance, Gallant Foe, whose defeat afforded one of those rare instances when the crowd differed from Mr. Hedley; Contango, that sire of sires, the worthy mate of Bed of Stone, being the son of Bab at the

SUCH A SELL, RUNNER-UP TO DENDRASPIS.

Bowster, perhaps the best greyhound of modern days; Lord Glendyne, the grandsire of Miss Glendyne; that sensational bitch Coomassie, possibly the smallest and the smartest winner of the Cup, whose pedigree unfortunately must for ever remain unknown; Misterton, the winner of the Cup in a memorable year when on the second day the courses were run with two or three inches of snow on the ground, fatal in many cases to the fastest dog from the hare doubling back: the conqueror in a scrimmage, not a trial: the sire of the largest number of winners, and yet a strain to be avoided; Princess Dagmar, one of the famous Ptarmigan and Gallant Foe family; Snowflight, whose victory and defeat alike were full of incident. But few of these appeal to our memories as quite of the class of that wonderful time about forty years ago. Not even Greentick, sterling and honest and unlucky greyhound as he was, the premier of stud dogs, quite fulfils our ideal. It is not till we remember the exquisitely finished style of Miss Glendyne, and the resolute manner of Herschel, who would never be denied, that we have good grounds for not despairing of the quality of the breed. It was a thousand pities that a broken toe prevented Miss Glendyne from meeting Herschel, when we might have been treated to such another display as the never-to-be-forgotten struggle between Master M'Grath and Bab at the Bowster. It is true that Bit of Fashion divided the honour of her first Cup with Miss Glendyne, but in the opinion of most the one owed her forward position to good fortune, the other to merit. They were both by Paris, a brother of Princess Dagmar, and one of that brilliant family of Ptarmigan and Gallant Foe, which for a while had the monopoly of the Waterloo Cup as Herschel's has now. Bit of Fashion has earned a higher fame in being the dam of Fullerton, who stands pre-eminent among dogs as the winner or divider of four Cups, as much an idol of the public as Master M'Grath, and probably of the same class, as their owners carefully declined to subject them to that test of stoutness which appeals to every courser's heart, however much he may admire the speed which brings a dog first to the hare and the carefulness which keeps him in his place. The victories of Texture and Thoughtless Beauty produced two sterling good greyhounds, but there was in each case a slight flavour of luck which prevents them from taking the highest place unchallenged by the carping critic. Fabulous Fortune and his family promise to rival that of Ptarmigan and Gallant Foe, and yet in their case health or condition have shown them in such different colours that, much as we must admire their cleverness, their honesty, and their resolution, they seem to bring the qualification of constitution into too much prominence.

There are so many varying circumstances which attend the success or failure of a dog that mere success in the field cannot be received as decisive evidence; there must be an appeal for a new trial. A case in point is furnished by Mineral Water and Greentick. Twice they met; twice did Mineral Water receive the verdict. At Gosforth the judge overruled the jury; but an appeal to the stud-book and the calendar leaves no doubt as to the merits of each dog. Mineral Water scarcely survives in any kennel but that of Sir Thomas Brocklebank, while Greentick has founded a dynasty.

Accepting the fact of a dog having transmitted his excellence to his posterity as a necessary confirmation of the verdict of the judge, and applying this criterion in examining the claims of the dogs named in the foregoing pages, we must allow that, with one or two exceptions, they have all established their right to a place in the Valhalla of greyhounds.

Even this must be received with some reservation, for the union of a dog with a certain bitch may have met with very great success, while his failure with others may have been just as striking. Witness the produce of Beacon and Scotland Yet, Ptarmigan and Gallant Foe. But with bitches it is altogether different. From circumstances beyond control, a bitch may not have been mated with the right dog, or the produce may have died, or she herself may have been short-lived, while during her running career she herself may have not been able to take part in the great contests of the season. Riot and Prizeflower, and perhaps Carlton, may be cited as instances of the latter kind, while Cerito and Bed of Stone left behind them only one representative each in Hopmarket and Bedfellow—produce which alone were enough to place their parents in the highest class.

Most of these dogs had their characteristics and peculiarities. Fullerton comes first as the winner and divider in four consecutive contests for the Cup. He was certainly a fast dog, though his brother Simonian could always lead him; but among a crowd of mediocrities he stood forth as a giant. He was brimful of wisdom. With a competitor of the same class it might have been to his disadvantage; as it was, he expended it on the handling of the hare, which was a treat to see.

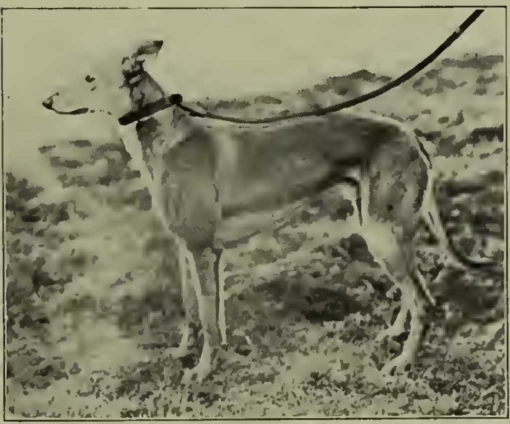
Master M'Grath comes next as the winner of three Cups. A small, shabby dog, called by some the Irish terrier, he went like a bolt out of the slips, was as quick as a cat on his feet, and always dashing for a kill, which he seldom missed.

Heavy Weapon, Winner of the Waterloo Cup, 1910.

We will pass by Coomassie, probably the smallest winner ever recorded, as quick as lightning with the hare, and a deadly killer, an art said to have been brought to perfection by practice in killing rabbits on a farm, for she seems to have failed in stamping her quality on her progeny. We come to Miss Glendyne, by some thought to have been the finest greyhound of modern days, good all round; and if she had not broken a toe it is more than possible that she might have kept the Cup at Shortflatt Tower till her nephew was ready to take her place. Then, passing over the family of Ptarmigan and Gallant Foe—viz., Paris, Palmbloom, Pathfinder, Peter, Prenez Garde, Princess Dagmar, Jester, and others, of whom it may be said that they were all big, fine, slashing dogs, carrying a good deal of flesh, with plenty of pace and cleverness, and not too fond of following their game if they could not kill—we take a great stride backwards to Canaradzo and his family, passing by the way that good hard dog Cauld Kail, a lightly made, wiry animal who could run in every country, but more especially on the hills, where he always managed to get the upper side, and if the hare disappeared over a knoll he ran all the harder to catch sight again, an intelligence he inherited from his famous granddam, Ladylike. This family of Beacon and Scotland Yet comprised Canaradzo, Coorooran, Canopy, Seafoam, Seapink, Bugle, and some others. They all had a peculiar style of stealing away with the smoothest of action, seemingly making a race of it with their opponent, but drawing out at the finish, rattling the hare about viciously, and quickly killing at a long shot.

The sire of Seacove, Strange Idea, deserves some mention. Seacove was a granddaughter of Bugle, brother of Canaradzo, with all the cleverness of the family but not the colour. Strange Idea was one of the winning produce of High Idea; fast and clever, with a peculiar manner of wearing their hares, which ran up points very effectively, they both were always more dangerous to meet at the beginning than the end of a stake. And lastly, we come to Herschel, only half a winner, to the regret of all who respected his owner and felt what a tower of strength he presented to coursing in the light of a relaxation, not a business, to the genuine sportsman. Gladly would he have been hailed as the holder of the long-coveted prize, and quite as enthusiastically would the dog himself have been cheered on his complete victory. However, it was not to be. Misfortune followed him the following years, and he retired to the stud, where, if quality of produce be the test, he stands *facile princeps* in the pages of the calendar.

Some of the bitches who have been winners have been mentioned incidentally, but Bab at the Bowster deserves a second notice. Probably the best greyhound of modern days, she proved her excellence in all countries, over the plains of Altcar, on the hills of Lanarkshire, with the stout hares of Southport, and set her seal on her claim of precedence by producing Contango, Banrigh, The Admirable Crichton, and a number of others, whose blood runs in the veins of every successful greyhound of these days. The peculiar merits of Riot also should not be overlooked, especially in



Full Steam, Runner-up to Heavy Weapon, Waterloo Cup 1910.

these later times, when the owner of Master M'Grath set the fashion of keeping his dog for one contest only in the season, an unsatisfactory proceeding, to put it in the mildest way, followed by the trainer of Fullerton. The record of Riot, on the contrary, shows us that she was running every fortnight or three weeks, weather permitting, for three seasons, giving a total of 84 courses run, of which she won 74, a fitting moral wherewith to end the dissertation on the celebrities of the stud-book. But perhaps a short account of two most exciting courses within the last thirty years may furnish a tail-piece of greater interest. The first of these two memorable courses was that between Herschel and Fullerton in 1889, in the last tie but one. What with a wet season, and water standing in pools, the hares were running very badly, only three or four hares escaping in the three days. Fullerton had the reputation of being a bad killer at home, but with the weak hares he took his share in the deaths. The courses, and especially his, seemed to be very short, so he was very fresh for his fifth course. Herschel, on the contrary, was lamed in his very first course; and on the second day, for his fourth course, he ran a hare single-handed from the Withins to Gore House Wood, and in coming back he got on two fresh hares, and ran them till he lay down exhausted. As a natural consequence, the next day he started very stiff from the slips, and Fullerton led him by three lengths, and put in three or four wrenches. Herschel then exchanged, and put Fullerton in possession, and then by a magnificent effort forced himself past, fairly took the hare away from him, wrenched two or three times strongly, seeming to leave Fullerton, and unfortunately killed.

The excitement of seeing the old dog, stiff and lame, fairly take the hare from the young and fresh puppy was intense, and many thought it was the finest performance of a brilliant career.

The other course was one which roused the feelings of the onlookers to a still greater extent. It was the deciding course for the Cup in 1869, fought out between Master M'Grath and Bab at the Bowster. The course was run on the farthest of the Hill House meadows, which is bounded by the road leading to the Withins. The crowd was standing on the embankment, the hare coming straight to them. A little knot of spectators was placed broadside on, near the road. The hare was driven from the other side of the main road, a beat which usually affords good hares. The slip was a perfect one, worthy of Tom Raper, that prince of slippers. Master M'Grath began as usual to draw out, but in a long straight run, parallel with the ditch, Bab at the Bowster gradually collared him, and as they neared the bridge a cry from that little band on the road arose, "The bitch leads!" and leading she was by half a length when the hare took the bridge. This was fatal to her; she had to go round, while Master M'Grath, with his wonderful quickness, was across the ditch on the inside like a flash. The hare doubled right back, and then there followed a long series of the quickest of exchanges, a treat indeed to see, when Master M'Grath, nearly at the place they had started from, drew out and made one of his dashing kills. Everyone felt convinced that they had then seen the finest pair contest the final for the Cup in the finest style which it was ever likely for them to behold. The winners in these two courses undeniably stand out as the most successful in the contests for the Cup, and yet they both have turned out worthless at the stud, while the losers have distinctly conferred on the whole race of greyhounds those qualities which we all desire to see and strive after; the qualities whose praises have been sung in the foregoing pages with, it is to be feared, wearisome iteration, but certainly with heartfelt appreciation. No doubt not only pace but special quickness with the hare are called for at Altcar more than anywhere else. Master M'Grath and, we may add, Fullerton were dogs of this character, a shade above the dog-racing of the enclosures. But anyone who has had the pleasure of seeing the coursing at Altcar at club meetings of late years will feel that stoutness and true running are absolutely necessary for success, and as the hare leads them a far from merry dance, the owners of the cracks must sigh in vain for the deadly jaws of the Canaradzo tribe.

W. ELLIS.

GLOSSARY.

Brace.—A pair of greyhounds.

Bye.—A course in which, owing to the withdrawal of its opponent, or to an odd number at the bottom of the stake, a greyhound has no one to meet. The first class of bye is called *accidental*, the second *natural*.

Collars.—When two greyhounds of the same colour are coursing they are ordered to wear a red and a white collar respectively, the red being on the left and denoting the upper dog on the card.

Cote.—An old coursing term, signifying that when two dogs start together, and one outruns the other and turns or wrenches, it be allowed two points, or three points if the hare be bent on the outer circle.

Division.—When two or more greyhounds left in a stake divide either by mutual arrangement on the part of the owners, or compulsorily through bad weather or scarcity of hares.

Draw.—Of the owner; to withdraw a dog. Also the classifying of the greyhounds prior to the running for a stake.

Enter.—Of the trainer; to show the young dog its game for the first time, and to prepare it for coursing.

Exchanging.—Of the greyhound; when the dogs alternately move the hare from her course, they exchange points.

Fence.—Of the greyhound; the act of leaping over a fence or other obstacle.

Fewterer.—The old term for *slipper* (*q.v.*).

Flag Steward.—The official responsible for signalling the judge's decision, after a course.

Fleck.—Of the greyhound; to snatch the hare and lose hold.

Form.—The resting place of a hare.

Gaze-hound.—The old term for hounds only able to follow game by sight, which were probably the ancestors, in large measure, of the modern greyhound.

Go-by.—The starting of a greyhound a clear length behind his opponent, passing him in a straight run, and obtaining a clear length's lead.

Guarding.—When two or more greyhounds are entered in a stake, the *bona-fide* property of the same owner, the order of running is altered, so that they may meet other greyhounds, should they come together.

Hare Bearing.—Favouring one of the greyhounds, after the slip. In Queen Elizabeth's time the term signified a go-by.

Home.—A refuge for hares.

Law.—The amount of space a hare is allowed to run after being put up before the hounds are slipped. In Queen Elizabeth's time the nominal distance was twelve score yards, but since the country has become more cut up, from sixty to eighty yards is the rule.

Leash.—(1) The line used to retain the dogs until the order comes for slipping.

(2) Sometimes used as a term defining the whole practice and pursuit of coursing.

Long Dogs.—An old term for greyhounds.

Lurching.—Of the greyhound; running cunning, and leaving the most part of the work to its opponent.

Meuse or **Muse**, or **Musit.**—(2) and (3) are obsolete. Gaps in the hedge through which the hare can escape.

Mob.—To press a hare unfairly by the crowd.

National Coursing Club.—The governing body of the sport, founded in 1858. In that year they drew up a code of rules, which, very slightly altered, is now almost universally observed.

No Course.—A course which, owing to accident, or to shortness of duration, gives the judge no opportunity of deciding the comparative merits of the dogs.

Ns.—An abbreviation of the word "names," indicating that a greyhound is entered by other than its registered owner.

Pot-hunting.—Coursing in which the object is not to test the relative merits of dogs and game, or of dog and dog, but simply and solely to kill the hare.

Produce Stakes.—A stake for collection of puppies, usually entered before the commencement of the running season.

Puppy.—A greyhound whelped on or after the 1st of January, of the year preceding the commencement of the season of running. See also *sapling.*

Rick.—Old term for *wrench* (*q.v.*)

Sapling.—A greyhound whelped on or after the 1st of January of the same year in which the season of running commenced.

Serving.—Of the greyhound; when a dog turns his hare, and keeps his place for another turn, he serves himself; or, losing his place, serves his opponent.

Slipper.—The official entrusted with the task of letting the dogs go when they have both fairly sighted the hare.

Slip Steward.—The official responsible for greyhounds going to slips within the proper time.

Slips.—The couples by which the two dogs are held whilst the hare is put up.

So-ho.—The cry used to indicate a sitting hare.

Stud Book.—The official registry of running and breeding greyhounds.

Trip.—An unsuccessful effort to kill which throws the hare off her legs, or the getting so close to the hare as to *fleck* (*q.v.*) her.

Turn.—A sharp change of not less than a right angle in the hare's course when pressed by a dog.

Undecided Course.—A course in which the number of points scored by the greyhounds is considered by the judge to be equal.

Unsighted, To be.—Of the greyhound; to lose sight of the hare, either when slipped, or at any part of the course.

Waiting.—Of the greyhound; lying behind an opponent, and never making an effort to get near the hare; in other words, waiting a chance to kill.

Wrench.—A change of less than a right angle in a hare's course when pressed.

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CRICKET —Wherever Englishmen plant the Union Jack they are sure to set up the wickets as well. Other European nations have never taken kindly to the game, but the natives of many of the lands we have occupied have soon learned to appreciate its merits. In Samoa legislation has interfered to limit the pursuit of the game; in Fiji it is thoroughly acclimatised; many years ago a team of Australian aborigines—not in any way to be confounded with the crack Colonial elevens—visited England; the Parsees of India have sent—and that portion of the Empire is eager to send once more—a team to try conclusions with us; and, finally, the crack bat of 1896, in 1900, and again in 1904, was an Indian prince. It is needless to add that Englishmen settled abroad have in no way shown themselves more English than in their enthusiasm for the national game, and the Australians in particular have proved that they are well able to meet and beat the best English sides.

The original popularity of the game was no doubt due to the amateurs who devoted themselves to its practice and extension; but it was only natural in the process of events that another class should spring up, consisting of men who have great ability for the game, but neither the spare time nor the spare money necessary for its cultivation; and, as the keenness between counties and clubs increased, the paid services of this class were enlisted, till professional cricketers became the backbone of the game; and it is not too much to say that thousands of men are now earning a livelihood by means of cricket.

The Origin of the Game.—Like many another branch of sport, the origin of cricket may be said to be wrapped in mystery. One can easily imagine the pleasure derived by the youth of the Early Ages in striking some round substance, possibly hurled by a comrade, the introduction of a more carefully prepared weapon and projectile, the choice of an object to be defended, and the arrangement of some system, crude enough in its way, by which the relative merits of the defenders might be determined. As far back as the twelfth century we have mention of "cricks," and earlier still of the "club ball" of the Norman era, whilst Chaucer mentions cricket in his "Canterbury Tales." There are drawings of the game of bat and ball in the thirteenth century, and, without diving deeply into a subject to which many pages might be devoted, there are frequent references prior to the beginning of the eighteenth century when reliable records of the pastime are to be found.

One of the earliest references to a match was to a contest between West Kent and Chatham in 1705, and it is set forth in "The History of Kent Cricket" how in 1719 a contest between that county and London led to a trial at law, and a Rule of the Court for the match to be played out on the White Conduit Fields, Kent losing by 21 runs. Mr. F. S. Ashley-Cooper contributes to the volume in question a complete list of results of the games played by the county—now the Champions—from that date onward, but the earliest rules are of rather later date. His Royal Highness Frederick, Prince of Wales, son of George II., took an active part in the game, and much money generally depended on the results. The earliest fully recorded score of a match was that decided on the Artillery ground at Finsbury in June, 1744, when Kent proved successful by one wicket. Surrey, Middlesex, Norfolk, and Hampshire were also among the earliest nurseries of the game, and in the latter portion of the eighteenth century the Hambledon Club was able to hold its own against All England. It has been popularly supposed that the death of Frederick, Prince of Wales, in 1751 was due to a blow received from a cricket ball, but of late years research has cast doubts on this, though examination after death proved that an abscess on the lungs had burst.

Until the eighteenth century was well advanced, the stumps were only two in number, with a bail across. Beneath them was a hole, into which in running the striker had to put his bat, the wicket-keeper the ball in order to run out the striker. Then came the introduction of a popping-crease and the addition of a third stump, and in 1817 the wicket had a second bail added, and the dimensions were increased to their present proportions, namely, 27 inches high and 8 inches in width.

The Laws of Cricket.—The Marylebone Cricket Club, with its headquarters at Lord's Ground, St. John's Wood, is the supreme legislative assembly as regards Cricket, and it is to the M.C.C. that cricketers look for the revision and alteration of the laws when necessary. Those laws, as revised, are as follows:—

THE LAWS OF CRICKET.

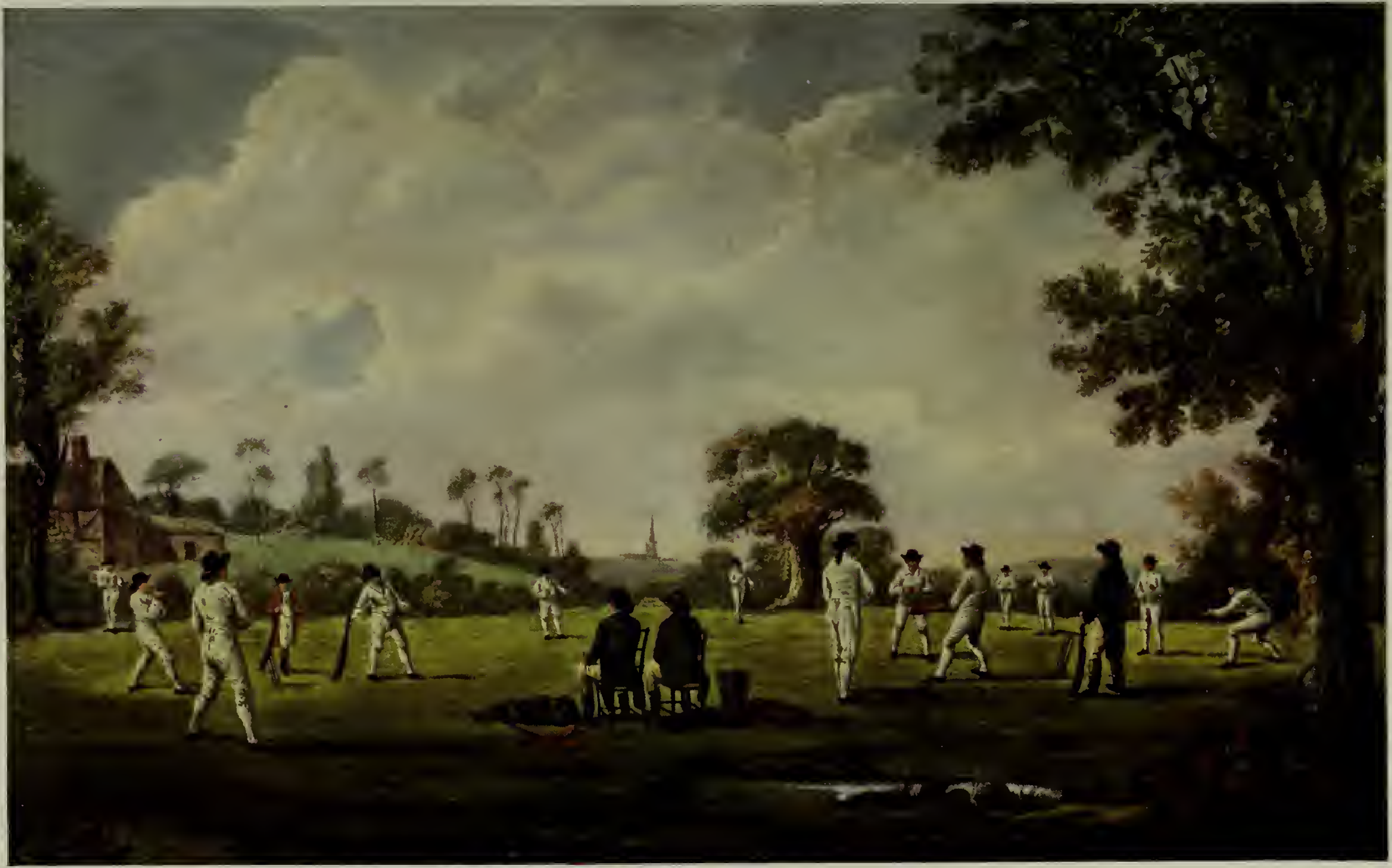
As Amended by the Marylebone Club, 1884, 1889, 1894, 1899, 1900, 1902, *and* 1906.

1. A match is played between two sides of eleven players each, unless otherwise agreed to; each side has two innings, taken alternately, except in the case provided for in Law 53. The choice of innings shall be decided by tossing.

2. The score shall be reckoned by runs. A run is scored:—

1st. So often as the batsmen after a hit, or at any time while the ball is in play, shall have crossed, and made good their ground, from end to end.

2nd. For penalties under Laws 16, 34, 41, and allowances under 44.



From an old print.

By permission of Messrs. Fores, 41 Piccadilly, London, W.

A MATCH AT HAMBLEDON, 1777.

Any run or runs so scored shall be duly recorded by scorers appointed for the purpose. The side which scores the greatest number of runs wins the match. No match is won unless played out or given up, except in the case provided in Law 45.

3. Before the commencement of the match two Umpires shall be appointed; one for each end.

4. The Ball shall weigh not less than five ounces and a half, nor more than five ounces and three-quarters. It shall measure not less than nine inches nor more than nine inches and one-quarter in circumference. At the beginning of each innings either side may demand a new ball.

5. The Bat shall not exceed four inches and one-quarter in the widest part; it shall not be more than thirty-eight inches in length.

6. The Wickets shall be pitched opposite and parallel to each other at a distance of twenty-two yards. Each wicket shall be eight inches in width and consist of three stumps, with two bails upon the top. The stumps shall be of equal and sufficient size to prevent the ball from passing through, twenty-seven inches out of the ground. The bails shall be each four inches in length, and when in position, on the tops of the stumps, shall not project more than half an inch above them. The wickets shall not be changed during a match, unless the ground between them become unfit for play, and then only by consent of both sides.

7. The Bowling Crease shall be in a line with the stumps: eight feet eight inches in length; the stumps in the centre; with a Return Crease at each end, at right angles behind the wicket.

8. The Popping Crease shall be marked four feet from the wicket, parallel to it, and be deemed unlimited in length.

9. The Ground shall not be rolled, watered, covered, mown, or beaten during a match, except before the commencement of each innings and of each day's play, when, unless the In-side object, the ground shall be swept and rolled for not more than ten minutes. [A proposal is under consideration to allow the ground to be rolled five minutes over night and five minutes before play is resumed.] This shall not prevent the batsman from beating the ground with his bat, nor the batsmen nor bowlers from using sawdust to obtain a proper foothold.

10. The Ball must be bowled; if thrown or jerked, either Umpire shall call "No Ball."

11. The Bowler shall deliver the Ball with one foot on the ground behind the bowling crease, and within the return crease, otherwise the Umpire shall call "No Ball."

12. If the Bowler shall bowl the Ball so high over or so wide of the wicket that, in the opinion of the Umpire, it is not within reach of the striker, the Umpire shall call "Wide Ball."

13. The Ball shall be bowled in Overs of six balls from each wicket alternately. When six balls have been bowled, and the ball is finally settled in the Bowler's or Wicket-keeper's hands, the Umpire shall call "Over." Neither a "No Ball" nor a "Wide Ball" shall be reckoned as one of the "Over."

THE 'VARSITY MATCH AT LORD'S, 1910.

14. The Bowler shall be allowed to change ends as often as he pleases, provided only that he does not bowl two Overs consecutively in one innings.

15. The Bowler may require the Batsman at the wicket from which he is bowling to stand on that side of it which he may direct.

16. The Striker may hit a "No Ball," and whatever runs result shall be added to his score; but he shall not be out from a "No ball" unless he be run out or break Laws 26, 27, 29, 30. All runs made from a "No Ball," otherwise than from the bat, shall be scored "No Balls," and if no run be made one run shall be added to that score. From a "Wide Ball" as many runs as are run shall be added to the score as "Wide Balls," and if no run be otherwise obtained one run shall be so added.

17. If the ball, not having been called "Wide" or "No Ball," pass the Striker without touching his bat or person, and any runs be obtained, the Umpire shall call "Bye"; but if the ball touch any part of the Striker's person (hand excepted) and any run be obtained, the Umpire shall call "Leg Bye," such runs to be scored "Byes" and "Leg Byes" respectively.

18. At the beginning of the match, and of each innings, the Umpire at the Bowler's wicket shall call "Play"; from that time no trial ball shall be

allowed to any bowler on the ground between the wickets, and when one of the batsmen is out the use of the bat shall not be allowed to any person until the next batsman shall come in.

19. A Batsman shall be held to be "out of his ground" unless his bat in hand or some part of his person be grounded within the line of the Popping Crease.

20. The Wicket shall be held to be "down" when either of the bails is struck off, or, if both bails be off, when a stump is struck out of the ground.

The STRIKER is out—

21. If the wicket be bowled down, even if the ball first touch the Striker's bat or person:—"Bowled."

22. Or, if the ball, from a stroke of the bat or hand, but not the wrist, be held before it touch the ground, although it be hugged to the body of the catcher:—"Caught."

23. Or, if in playing at the ball, provided it be not touched by the bat or hand, the Striker be out of his ground, and the wicket be put down by the wicket-keeper with the ball, or with hand or arm with ball in hand:—"Stumped."

24. Or, if with any part of his person he stops the ball, which in the opinion of the Umpire at the bowler's wicket shall have been pitched in a straight line from it to the Striker's wicket and would have hit it:—"Leg before wicket."

25. Or, if playing at the ball he hit down his wicket with his bat or any part of his person or dress:—"Hit wicket."

26. Or, if under pretence of running, or otherwise, either of the batsmen wilfully prevent a ball from being caught:—"Obstructing the field."

27. Or, if the ball be struck or be stopped by any part of his person, and he wilfully strike it again, except it be done for the purpose of guarding his wicket, which he may do with his bat, or any part of his person, except his hands:—"Hit the ball twice."

Either BATSMAN is out—

28. If in running, or at any other time, when the ball is in play, he be out of his ground, and his wicket be struck down by the ball after touching any fieldsman, or by the hand or arm, with ball in hand, of any fieldsman:—"Run out."

29. Or, if he touch with his hands or take up the ball while in play, unless at the request of the opposite side:—"Handled the ball."

30. Or, if he wilfully obstruct any Fieldsman:—"Obstructing the field."

31. If the batsmen have crossed each other, he that runs for the wicket which is put down is out; if they have not crossed, he that has left the wicket which is put down is out.

32. The Striker being caught no run shall be scored. A Batsman being run out, that run which was being attempted shall not be scored.

33A. A Batsman being out from any cause, the ball shall be "Dead."

33B. If the ball, whether struck with the bat or not, lodges in a Batsman's clothing, the ball shall become "Dead."

34. If a ball in play cannot be found or recovered, any fieldsman may call "Lost Ball," when the ball shall be "Dead"; six runs shall be added to the score; but if more than six runs have been run before "Lost Ball" has been called, as many runs as have been run shall be scored.

35. After the ball shall have been finally settled in the Wicket-keeper's or Bowler's hand, it shall be "Dead"; but when the Bowler is about to deliver the ball, if the Batsman at his wicket be out of his ground before actual delivery, the said Bowler may run him out; but if the Bowler throw at that wicket and any run result, it shall be scored "No Ball."

36. A Batsman shall not retire from his wicket and return to it to complete his innings after another has been in, without the consent of the opposite side.

37. A substitute shall be allowed to field or run between wickets for any player who may during the match be incapacitated from illness or injury, but for no other reason, except with the consent of the opposite side.

38. In all cases where a substitute shall be allowed, the consent of the opposite side shall be obtained as to the person to act as substitute, and the place in the field which he shall take.

39. In case any substitute shall be allowed to run between wickets, the Striker may be run out if either he or his substitute be out of his ground. If the Striker be out of his ground while the ball is in play, that wicket which he has left may be put down and the Striker given out, although the other batsman may have made good his ground at that end, and the Striker and his substitute at the other end.

40. A Batsman is liable to be out for any infringement of the laws by his substitute.

41. The Fieldsman may stop the ball with any part of his person, but if he wilfully stop it otherwise, the ball shall be "Dead," and five runs added to the score; whatever runs may have been made, five only shall be added.

42. The Wicket-keeper shall stand behind the wicket. If he shall take the ball for the purpose of stumping before it has passed the wicket, or, if he shall incommode the Striker by any noise, or motion, or if any part of his person be over or before the wicket, the Striker shall not be out, excepting under Laws 26, 27, 28, 29, and 30.

43. The Umpires are the sole judges of fair or unfair play, of the fitness of the ground, the weather, and the light for play; all disputes shall be determined by them, and if they disagree the actual state of things shall continue.

44. They shall pitch fair wickets, arrange boundaries where necessary, and the allowances to be made for them, and change ends after each side has had one innings.

45. They shall allow two minutes for each striker to come in, and ten minutes between each innings. When they shall call "Play," the side refusing to play shall lose the match.

46. They shall not order a batsman out unless appealed to by the other side.

N.B.—An appeal "How's that?" covers all ways of being out (within the jurisdiction of the Umpire appealed to), unless a specific way of getting out is stated by the person asking.

47. The Umpire at the bowler's wicket shall be appealed to before the other Umpire in all cases except those of stumping, hit wicket, run out at the Striker's wicket, or arising out of Law 42, but in any case in which an Umpire is unable to give a decision, he shall appeal to the other Umpire, whose decision shall be final.

48. If either Umpire be not satisfied of the absolute fairness of the delivery of any ball, he shall call "No Ball.'

48A. The Umpires shall take especial care to call "No Ball" instantly upon delivery: "Wide Ball" as soon as it shall have passed the striker.

49. If either batsman run a short run, the Umpire shall call "One short," and the run shall not be scored.

50. After the Umpire has called "Over" the ball is "Dead," but an appeal may be made as to whether either batsman is out; such appeal, how-

ever, shall not be made after the delivery of the next ball, nor after any cessation of play.

51. No Umpire shall be allowed to bet.

52. No Umpire shall be changed during a match, unless with the consent of both sides, except in case of violation of Law 51; then either side may dismiss him.

53. The side which bats first and leads by 150 runs in a three days' match, or by 100 runs in a two days' match, shall have the option of requiring the other side to follow their innings.

54. The In-side may declare their innings at an end in a three days' match at any time on the second day; in a two days' match, the Captain of the batting side has power to declare his innings at a close at any time, but such declaration may not be made on the first day later than one hour and forty minutes before the time agreed on for drawing stumps; in a one day match at any time.

crease in a line with his bat, or some part of his person, or go beyond them, and return to the popping crease.

4. When the Striker shall hit the ball, one of his feet must be on the ground behind the popping crease, otherwise the Umpire shall call "No hit," and no run shall be scored.

5. When there shall be less than five players on a side, neither Byes, Leg Byes, nor Overthrows shall be allowed, nor shall the Striker be caught out behind the wicket, nor stumped.

6. The fieldsman must return the ball so that it shall cross the ground between the wicket and the bowling stump, or between the bowling stump and the bounds; the striker may run till the ball be so returned.

7. After the Striker shall have made one run, if he start again he must touch the bowling stump or crease, and turn before the ball cross the ground to entitle him to another.

ENGLAND V. AUSTRALIA AT BIRMINGHAM, 1909. A GOOD CATCH.

ONE DAY MATCHES.

1. The side which bats first and leads by 75 runs shall have the option of requiring the other side to follow their innings.

2. The match, unless played out, shall be decided by the first innings. Prior to the commencement of a match it may be agreed: that the Over consist of 5 or 6 balls.

N.B.—A Tie is included in the words "Played out."

SINGLE WICKET.

The Laws are, where they apply, the same as the above, with the following alterations and additions.

1. One Wicket shall be pitched, as in Law 6, with a Bowling Stump opposite to it at a distance of twenty-two yards. The Bowling crease shall be in a line with the bowling stump, and drawn according to Law 7.

2. When there shall be less than five players on a side, Bounds shall be placed twenty-two yards each in a line from the off and leg stump.

3. The ball must be hit before the Bounds to entitle the Striker to a run, which run cannot be obtained unless he touch the bowling stump or

8. The Striker shall be entitled to three runs for lost ball, and the same number for ball wilfully stopped by a fieldsman otherwise than with any part of his person.

9. When there shall be more than four players on a side there shall be no bounds. All Hits, Byes, Leg Byes, and Overthrows shall then be allowed.

10. There shall be no restriction as to the ball being bowled in Overs, but no more than one minute shall be allowed between each ball.

INSTRUCTIONS TO UMPIRES.

[THESE Instructions are intended as an appendix to the Laws of the Game, and were first drawn up in 1892 by the Committee of the M.C.C., being added to or amended in 1902, 1906, and 1907.

FITNESS OF GROUND.

Law 43.—At the commencement of a match, the Umpires may be appealed to by either side as to the fitness of the ground for play.

Should they not agree, play will not commence until they are agreed.

In case of interruption from rain, as soon as the rain has ceased, the Umpires shall, immediately, without further instruction, inspect the wicket, unaccompanied by any of the players, and decide upon its fitness. Should it prove unfit, they shall continue to inspect at intervals, until they decide that it is fit for play, when they shall call upon the players to resume the game.

The ground is unfit for play—when water stands on the surface, or when it is so wet, muddy, or slippery as to deprive the bowlers of a reasonable foothold, or the fieldsmen of the power of free movement.

The Umpires are not to be biassed by the opinions of either side, still less are they to allow themselves to be influenced by the impatience of the spectators for a resumption of the game, and are not to be induced, by the public interest in a particular match, to declare the ground fit for play, unless they would consider that ground fit under any circumstances.

Umpires are not justified in deciding the ground unfit for play merely because the grass is wet and the ball would, in consequence, be slippery.

In order to facilitate play at the earliest possible moment in wet weather the Umpires shall see that the foot holes made by the bowlers and batsmen are cleaned out, dried, and filled up with sawdust at any time during the match, although the game is not actually in progress.

FITNESS OF LIGHT FOR PLAY.

The Umpires may decide, on appeal from the Captains, should the latter disagree, that there is not sufficient light for play. Should the light improve before the time for drawing stumps, they shall, without waiting for instructions, call upon the players to resume the game.

In the event of the Captains agreeing as to the condition of the ground or light, the Umpires will, so far, be relieved of their responsibility.

LAW 47.—An Umpire is only justified in appealing to the other Umpire when he is unable to decide, owing to his having been prevented from seeing the occurrence on which the appeal is based. He is not to appeal to the other Umpire in cases on which he could give a decision, merely because he is unwilling to give that decision. If he be in any doubt, the principle laid down in Law 43, "That the existing state of things shall continue," shall be followed, and, in consequence, the decision should be in favour of the batsman.

LAW 48.—The special attention of Umpires is called to this Law, which directs them to call "No Ball," unless absolutely satisfied of the fairness of the delivery.

Umpires should not allow themselves to be unduly influenced by appeals from such of the field who were not in a position to form a judgment on the point appealed upon, or by tricks—such as throwing up the ball, on appealing for a catch at the wicket, without waiting for the decision. Umpires, being the sole judges of fair or unfair play, should remember that such devices are obviously unfair, and are not in accordance with the spirit in which cricket should be played.

DECLARING—(LAW 54.)

(*a*) If a side declare its innings during the luncheon interval, it must do so within fifteen minutes after the commencement of such interval, otherwise an extra ten minutes will be allowed for rolling.

(*b*) If a side declare its innings closed in the morning before play commences, it must do so in sufficient time to enable the other side to choose the roller it prefers, otherwise an extra ten minutes will be allowed for rolling.

NEW BALL RULE.

(*Approved by the M.C.C. Committee, June 20th, 1907.*)

After 200 runs have been made with a ball the fielding side can demand a new one.

CODE OF SIGNALLING.

Boundaries shall be signalled by waving the hand from side to side.

Byes shall be signalled by raising the open hand above the head.

Leg-byes shall be signalled by raising the leg and touching it with the hand.

Wides shall be signalled by extending both arms horizontally.

No-Balls shall be signalled by extending one arm horizontally.

The decision "Out" shall be signalled by raising the index finger above the head.

Umpires should wait until a signal has been answered by the scorer before allowing the game to proceed.

Besides signalling, the Umpire should "call" distinctly for the information of the players.

On giving a decision the Umpire should make sure that the batsman understands what the decision is.

RULES OF COUNTY CRICKET.

The Rules now governing county cricket are as follows, Rules 6, 7, and 8 having, in order to meet the wishes of the counties, been revised by the M.C.C. Committee, in October, 1906:—Rule 1 was, on the recommendation of the Advisory Committee, extended by the M.C.C. in February, 1908, the immediate cause being the fact of Tarrant playing against the England Eleven in Australia.

1. A cricketer may not play for more than one County within the calendar year; the penalty for an infringement of this rule to be disqualification for two years. A British Colony, Dependency, or State shall, for the purposes of this rule, be regarded as a County.

2. QUALIFICATION BY BIRTH.—A cricketer is always eligible to play for the county of his birth.

3. QUALIFICATION BY RESIDENCE.—A cricketer is qualified to play for any county in which he has resided for the previous 24 months and is residing but:—

> (*a*) The mere acquirement or hiring of a tenement, unless used as a *bona fide* home, does not constitute "residence."
>
> (*b*) The occupation of a tenement during the cricket season only does not constitute "residence."

4. Where a cricketer uses as residences in the course of the year, tenements in more than one county, or where he leaves the country for the winter months, and in all other cases where his qualification is in any doubt, it is obligatory on the county for which he wishes to play to prove his qualification to the satisfaction of the M.C.C.

5. A cricketer who has played for a county for five successive years is qualified to play for that county for the rest of his cricket career, or until he plays for some other county.

6. A cricketer may play for any county for which he has acquired a residential qualification, for two successive years immediately after he has ceased to reside in such county.

7. *Transfers.*—A cricketer, already qualified for or engaged by a county, but wishing to qualify by residence for another county, must give notice in writing to the Cricket Club Committee of the

former county before he commences such residence; and a County Cricket Club wishing to engage, under a residential qualification, a cricketer who is already qualified for, or engaged by, another County Club, must inform the Committee of the latter before commencing negotiations with the cricketer.

8. *Appeal.*—Should any question arise, under these Rules, it shall be left to the decision of the M.C.C. Committee, which shall be final; and in the event of an infringement of Rule 7 the M.C.C. Committee shall have special authority to fix the date when the cricketer shall become qualified by residence or even to permanently bar his so qualifying.

On April 25th, 1910, the M.C.C. accepted the following recommendation:—"That any person on the Active list of the Army or Navy who has played for a county under the residential qualification for two or more seasons and is abroad on service shall retain his qualification on his return from abroad as if he had never been abroad."

Resolution approved by the M C.C. Committee, April 25th, 1910.

"That the M.C.C. suggests to the executive of each county ground to adopt any covering to protect the ground against rain at any time after seven o'clock a.m. on the morning of the first day of a match. After the actual commencement of play the ground may again be protected when necessary, and shall be protected every night during the continuation of a match, but the covering shall be removed each morning, if fine, at seven o'clock. The covering must not protect a larger area than 18 ft. by 12 ft. at each end, and must not protect more than 3 ft. 6 in. in front of the popping creases.

CLASSIFICATION OF COUNTIES.

Cricketing counties shall be considered as belonging to first class or second class

First-class counties are those whose matches with one another, with M.C.C. and Ground, with the Universities, with the Australians, and such other elevens as shall be adjudged "first-class matches" by the M.C.C. Committee, are used in the compilation of first-class batting and bowling averages.

Second-class counties are those not included in the first-class, and second elevens of first-class counties.

There shall be no limit to the number of first- or second-class counties. The M.C.C. Committee may bring new counties into the list, may remove existing ones from it, or do both.

THE COUNTY CHAMPIONSHIP (FIRST CLASS).

After the close of each cricket season the Committee of the M.C.C. shall decide the county championship.

It shall be competed for by first-class counties. No county shall be eligible unless it shall have played at least eight out and home matches with other counties, provided that if no play can take place owing to weather or other unavoidable cause such match shall be reckoned as unfinished.*

One point shall be reckoned for each win; one deducted for each loss; unfinished games shall not be reckoned.

The county which during the season shall have, in finished matches, obtained the greatest proportionate number of points shall be reckoned champion county.

The First-Class Counties are:—

Derbyshire
Essex
Gloucestershire
Hampshire.
Kent
Lancashire
Leicestershire
Middlesex
Northamptonshire
Nottinghamshire
Somerset
Surrey
Sussex
Warwickshire
Worcestershire
Yorkshire

Derbyshire, Essex, Hampshire, Leicestershire, and Warwickshire, were admitted to the Championship Competition in 1895, Worcestershire in 1899, and Northamptonshire in 1905.

At a meeting of the Advisory Board on March 21, 1910, the following alteration was recommended to the M.C.C., who agreed to give it a trial for the season of 1910:—

"That in scoring points in the County Championship draws and losses be ignored, only matches won to count in the percentage of matches played."

THE SECOND DIVISION CHAMPIONSHIP.

This Championship, promoted by the Minor Counties Association, and now officially recognised, has been frequently altered in its conditions. It is open to all counties not in the first class, and second elevens of first-class counties. Instead of four groups the number was, in September, 1909, reduced to two, each consisting of eleven competitors, viz.:—

NORTH AND EAST: Cheshire, Durham, Northumberland, Yorkshire (2nd XI.), Staffordshire, Notts (2nd XI.), Bedfordshire, Cambridgeshire, Norfolk, Suffolk, and Lincolnshire.

SOUTH AND WEST: Berkshire, Buckinghamshire, Hertfordshire, Surrey (2nd XI.), Dorset, Wiltshire, Devon, Cornwall, Monmouthshire, Glamorgan, and Carmarthenshire.

Each county must play home and home two-day matches, with at least four other counties in its division, and the two group winners meet in a three-days' final match.

ADVISORY COMMITTEE OF THE COUNTIES.

This body was, with the approval of the Counties, formed by the M.C.C. in 1904, to consider cases arising out of County Cricket, and consists of a representative of each First-Class County, appointed by his Committee, and three members representing and appointed by the Minor Counties Cricket Association, and at least one member of the M.C.C The Chairman to be the President of the M.C.C., or some other member of the Committee of the M.C.C. nominated by him, or, in default, by the Committee of the M.C.C., to which body all resolutions passed shall be submitted for confirmation.

A meeting may be convened by five, or more, First-Class Counties; or by the Minor Counties Cricket Association and two, or more, First-Class Counties; or by the M.C.C.

Notes on the Laws.—This code, even as revised, is not perfect, but the interpretation of any law and the settlement of any question for which the laws do not provide, are left to the umpires, whose ruling is (or ought to be) cheerfully accepted by both sides. A few notes, explanatory of points in the laws, follow.

Law 3. [*See* UMPIRES, p. 480.] In ordinary games, each side provides an umpire and scorer, but only men of strict integrity and impartiality should be allowed to stand. The umpires are "one for each end," not "each side."

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* This number has been reduced by the M.C.C on the occasion of visits from an Australian XI.

Law 4. The foundation of the ball is a cube of solid cork, wrapped round with layers of cork-shavings and very fine twine; over all is a tightly-sewn skin of reddish leather. A good ball will stand a great deal of knocking about, but bad ones soon lose their shape, in which case it is customary to allow a new one to be used, even in the middle of an innings.

Law 5. In the bat there is no relation required between the length of blade and handle; the blade is generally about 22 in. long, and the handle about 14 in., the full legal size being found inconvenient even for tall men. The blade is made of carefully-seasoned and selected willow, and the handle of numerous slips of cane glued together, with various patent additions to combine elasticity with strength.

Laws 6, 7, and 8. The following diagram will best explain how to "mark out the crease" (Fig. 1).

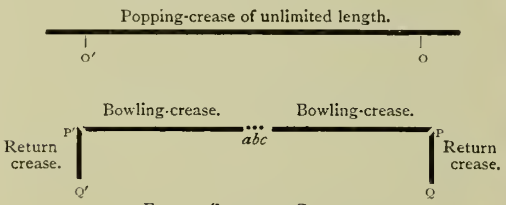


FIG. 1.—SCALE OF CREASES.

The distance between O and P, O' and P' is 4 ft. PQ and $P'Q'$ are the "return creases," and are of unlimited length; they are at right angles to Pc and Pa. The stumps are represented by a, b, and c; from a to c is 8 in., outside measurement of the wicket. Pa and Pc are 4 ft. long. The "popping crease" is so called because the bat is "popped" over it when the batsmen are completing a run; it should be made about 10 ft. long; the return crease should be about 18 in. long, as some bowlers are apt to get the hinder foot very wide.

Law 11. The umpire should call "No ball" *directly* the ball, wrongly delivered, has left the bowler's hand. [*See* Law 48A.] A bowler may bowl with both feet behind the bowling crease so long as one foot is within the return crease. A bowler knocking down the wicket in delivering the ball does not create a No-ball.

Law 12. The umpire must *call* the "wide"; some men only signal to the scorers with the hand [*see* p. 481], thereby confusing the batsmen. [*See* Law 48A.]

Law 16. The case has occurred before now of an umpire calling—wrongly—"Wide," before the ball has passed the batsman; of the batsman hitting the ball, and being caught. Is he "out"? The equitable decision is that he *is* out: the ball was proved, by the fact that the batsman hit it, *not* to be "wide," whatever the umpire thought, erroneously, that it was going to be. In other words, the umpire's *opinion* was confuted by the batsman's *action*, and if the latter had hit the ball for six he would be very dissatisfied if the runs were disallowed. A batsman cannot be stumped off a "no-ball."

Law 22. A fieldsman's hand may touch the ground; a fieldsman may touch or lean against a boundary to effect a catch.

Law 23. "With ball in hand" means "with the ball in the hand of the arm that knocks off the bail." If the wicket-keeper—or bowler, in the case of a "run out"—takes the ball in his right hand, and knocks down the wicket with his left hand or arm, or *vice versa*, the batsman is "not out." To remove one bail is sufficient.

ENGLAND V. AUSTRALIA AT THE OVAL, 1909. MR. C. B. FRY RUN OUT.

Law 24. It is quite possible for a batsman to be out "leg before" to a bowler bowling round the wicket. The stoppage must not be with the hand; the ball must pitch in the space within parallel lines drawn from wicket to wicket, and would have hit the wicket.

Law 27. "Wilfully strike" is interpreted to mean "strike with the intention of running," and hence if a batsman, having struck the ball a second time, with whatever motive, starts to run, it is usually assumed that he struck the ball "wilfully" a second time, and he is given out. He might, too, be caught under Law 22.

Law 30. The point of the rule is the word "wilfully"; the umpire alone can decide from the batsman's behaviour whether the obstruction was wilful, or accidental, or a legal effort to save his wicket, as provided by Law 27.

Law 33. A ball ceases to be dead when the bowler prepares to deliver a ball; nor is it "dead" through striking an umpire.

Single Wicket.—This form of the game, at one time very popular and often played for large stakes, has now practically disappeared. It need only be remarked that if five men, or more, play against less than five antagonists, the numerically weaker side has all the privileges conferred by Law 9, while the other party is bound by the special restrictions of Laws 2, 3, 5, 6, and 7.

Rules of County Cricket.—These rules, together with the "Classification of Counties," and the regulations for "The County Championship," are subject to alteration from time to time, as necessity arises, especially with regard to the calculation of points. The system as printed has been in use since the year 1896, but a new method of scoring points has been tried this season (1910), the old system not being entirely satisfactory.

How a Match is Played.—Having discussed and commented on the rules, the next point is their practical application to the game, as played by experienced cricketers, and the most convenient method will be to describe, as briefly as possible, the ordinary procedure. When both sides have mustered on the ground, each will be under the charge of a captain, who will manage the side, arrange the order in which his batsmen are to go in, and the place each man is to occupy in the field. The captains must also arrange at what time lunch is to be taken, and at what time "stumps are drawn," *i.e.*, at what time play stops for the day. If the match-inclosure is restricted by the presence of a ring of spectators or is limited in size, hits to the ring or to the boundary might not get their full value, and hence a nominal value is assigned to them by arrangement between the umpires [*see* Law 44], this value being accredited to the batsman if he hits the ball to the boundary, or to the score if the ball travels there in the way of "byes," "leg byes," "wides," or "no balls," under Laws 16 and 17. It is the business of the umpire at the bowler's end to decide whether the ball has actually reached the boundary. The usual allowance for such strokes is four runs, but if the ball is hit clean out of the ground, or in some cases pitches outside the ring of spectators, six runs are awarded, and this is now ordered by the M.C.C. on the motion of Kent County C.C. Three runs should never be recognised for a boundary hit, for the following reason: it may happen that towards the close of a game, when time is precious, a good batsman may be partnered by a bad one; the bowler will naturally be anxious to bowl to the inferior player, and if he finds the superior player opposed to him, he can deliberately sacrifice three runs by sending a ball to the boundary, and as after a hit or bye for an *odd* number of runs the batsmen "change ends"—this will be explained hereafter—the inferior player will have to receive the next ball bowled. This is also the reason why the batsmen do not change ends after a "wide" or "no ball" has been delivered.

[*Photo. by G. W. Beldam.*

Dr. W. G. Grace.

The boundaries and the times for stopping having been arranged, the captains then—but *not* before—toss for the choice of innings, the successful captain having the privilege of taking the first innings for his side, or of ordering the others to bat first. As a rule, it is wise to go in first [*see* p. 478]. The other side—the "fielding" side—then goes out to the ground; its captain appoints two men to bowl alternately from either end, and directs the others to take their proper places in the field, the umpires having preceded them to the ground. When all is ready, the two selected batsmen go to the wickets, having settled between themselves which is to receive the first ball.

And here a digression is necessary to explain the positions of the fieldsmen: their individual duties are explained later on, but it may be premised for the information of those who are not acquainted with the game, but who wish to become initiated into its mysteries, that the bowler is armed with the ball, and that his business is to try to get the batsman out in one of the various ways for which provision is made by the rules (Laws 21—30); that the fieldsmen endeavour to give him their best support, and that the batsmen, each in his turn, try with the aid of the bat to baffle their assaults, and increase their side's total. The duties of the umpires and scorers are explained on pp. 480 and 481.

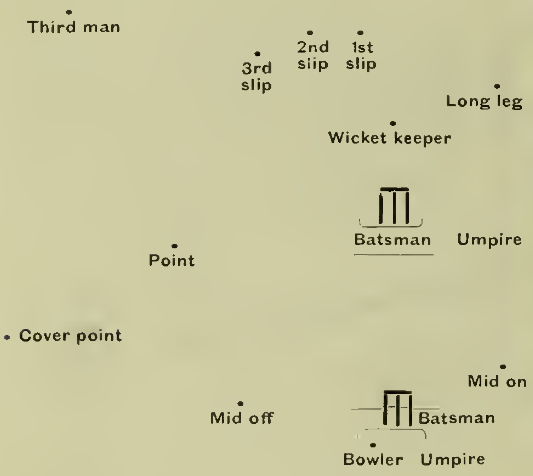


Fig. 2.—The Field as Set for Fast Bowling.

It is impossible to lay down any final statement as to the positions taken up by the different fieldsmen, many circumstances combining to influence the judgment of the captain and bowler—who should always work in concert on this point—as to the best arrangement of their forces; the most important of these circumstances are the pace of the bowling; the condition of the ground, whether fast or slow; the ability of the fieldsmen, and the character, known or to be discovered, of the striker, who may be a consistent hard-hitter, an occasional hard-hitter—perhaps in a particular direction only—or a quiet and steady batsman. Nothing except experience can guide the authorities on this point, but it is the duty of captain and bowler to watch the style of every new batsman as he comes in, to see whether any special alterations should be made in the field (*i.e.*, in the fielding side) with a view to getting him out. With this preface a couple of diagrams are here submitted, giving the usual positions of the fieldsmen, first for a fast bowler, and secondly for a slow bowler, it being assumed in each case that the batsman plays a free and sound game, hitting bad balls severely and playing the good ones with a fair amount of freedom. It may also be premised that to hit a ball from eighty to ninety yards before it reaches the ground is a good free stroke, but not at all beyond the power of an average hitter. In Fig. 2, then, the ground is supposed to be fast and in good order; the bowling is fast too, but not abnormally so; the batsman is supposed to be a free, clean hitter, but not of a phenomenal type; the fieldsmen are all supposed to be first-class. The side of the wicket on which the batsman stands is known as the "*on*- or leg-side"; the other as the "*off*-side." One umpire will be observed standing near the wicket at the bowler's end, the other in a line with the "popping crease," and about eighteen yards from it at the other end.

[*Photo. by G. W. Beldam.*

Dr. W. G. Grace.

After this long, but most necessary digression, we pick up the thread of our story from the point at which the fieldsmen and umpires were imagined to be ready in their places, and the batsmen, having settled which was to receive the first ball, had proceeded to their respective wickets. Batsman A, on going to his wicket, begins by asking the umpire at the other end to give him "Guard"; in other words, he holds up his bat in front of his wicket, the face towards the umpire, to ascertain whether his bat, as he holds it, is protecting his wicket from the bowler's attack. As the bowler may be either right-handed or left-handed, and may elect to bowl from either side of the wicket, this "guard" is somewhat important, for the batsman may be "out" (under Law 24) if he prevent with his leg the passage of the ball to the wicket, and the position of his bat, relative to the position of the bowler, will help him to stand so as to keep his legs clear. The three stumps are known as the "leg," "middle," and "off" stumps; the one nearest to the batsman being the "leg-stump." The umpire, placing himself as nearly as possible where the bowler's arm will probably come, or in such a place as the fancy of the batsman may suggest, looks at the bat, held upright about a foot behind the popping crease, and informs the batsman what stump or stumps are hidden from view by the bat; the batsman, when he has found the desired place, either makes a scratch with a bail or his spikes, or hammers a small hole in the ground with the point of the bat, and the ceremony is complete. The batsman now knows what position he occupies relative to the bowler's arm; the umpire looks to see if every one is ready, calls "Play!" and the game begins in earnest. If the batsman hits the ball past one of the fieldsmen, and he and his partner run across from wicket to wicket, each getting inside the popping crease without being "run out" (Law 28), one run is scored; if the process can be repeated, two runs, and so on. It may be observed that if an *odd* number of runs is made for a hit, batsman B will have to receive the next ball. When six balls have been delivered the umpire calls "Over!" A fresh bowler is deputed to bowl—this time from the other end—and the fieldsmen take up fresh places, but bearing the same relation to the position of the striker as before; but as we will suppose that the second bowler is a *slow* bowler, the position of the fieldsmen must be to some extent altered, somewhat as shown in Fig. 3.

Having dealt with the generalities of the game, the time has arrived to discuss its several points in detail—the batting, bowling, and fielding, and the best and recognised methods for acquiring proficiency in them; but first it must be premised that a first-class cricketer, or he who would be a first-class cricketer, must not devote his attention to one of these three sciences to the exclusion of the other two. The bowler, if anyone, is allowed to specialise, but even the best bowler's value is largely discounted if he is unable to catch and field.

In first-class cricket, as played nowadays, "all-round mediocrity," is not valued very highly, but a man who is a first-class bowler and fieldsman, or a first-class batsman and fieldsman, will always find a place in a first-class side, and, to become either of these, careful, patient, and whole-hearted practice is the only royal road. There are no "short cuts" to good cricket, though on a few fortunate individuals the science of the game seems to have descended like a revelation; their probation has been comparatively short, and their ultimate success unbounded. These, however, are the "lucky millionaires" of the game; the ordinary mortal can only win his way forward by determination, patience, and practice. With this short preface, to which, short as it is, too much attention cannot be paid, the discussion of the best methods of attaining comparative perfection—absolute perfection is impossible—may now logically follow, and the first paragraph shall, as is usual in works on cricket, be devoted to the batsman, for batting possesses a fascination of its own, which appeals with especial vehemence to ninety-nine out of every hundred cricketers.

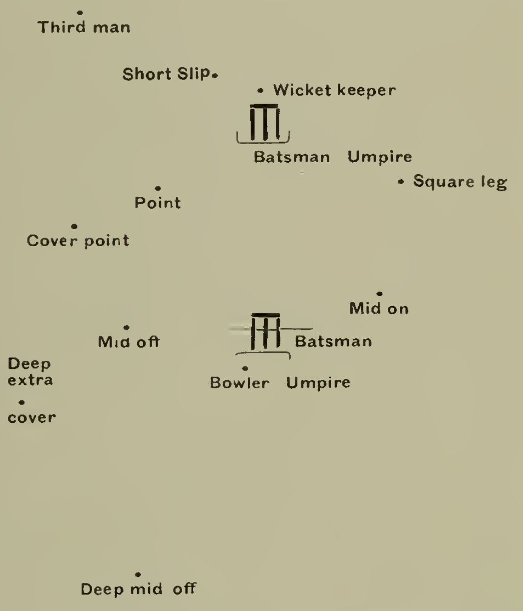


Fig. 3.—The Field as Set for Slow Bowling.

The Batsman.—First of all, a word of advice on the indispensable outfit of a batsman: "Never, under any conditions, go in to bat without pads or gloves; the slowest and easiest ball may hit one on the knuckle and carry away a piece of skin, or may glance off the bat on to shin or ankle." Yet there is one exception in first-class cricket, for Captain H. S. Bush, of Surrey, scorns the use of a glove against the fastest bowling. A word may be useful as to the selection of a bat, but every batsman must find out what kind of bat suits him best, and choose accordingly. The weight varies from 2 lb. to 2 lb. 10 oz., but only a man of special strength can use the latter weight, and the former is exceedingly light, so that the average weight varies from about 2 lb. 3 oz. to 2 lb. 6 oz., and it is worth while remembering that, as a bat should be rubbed fairly frequently with unboiled linseed-oil to keep it from getting dry, it always increases in weight. Weight, however, is hardly so important as balance, a well-balanced bat, though heavy, being far more easy to wield than a light, but ill-balanced weapon. All the makers of the present day turn out excellent bats, of well-seasoned willow, so that a good bat is easily procured, of a clean straight grain, free from knots and blemishes. Every man must find out the kind of handle that suits him best; indeed, the patent handles are innumerable, but the larger the handle the greater is the leverage, and, consequently, the greater the ease in handling the bat. If on grasping the handle with the right hand, the end of the middle finger reaches the ball of the thumb, and does not overlap it, the handle will be of the right size; but on this point, as in the matter of weight, every man has his idiosyncrasy. The bottom of the bat should not be too thin, as when a ball is struck with the end of such a bat, the fingers are apt to be unpleasantly jarred; nor should the handle be too stiff. As a firm grip of the handle is essential, an india-rubber casing is useful if the palm of the hand perspires. One further word of advice is necessary—*choose a bat which is too light, rather than one which is too heavy.* Everything depends upon quickness, and while it is easy to move a light bat slowly, it is impossible to move a heavy bat (*i.e.*, a bat too heavy for one's strength) quickly. It is no bad practice to go through the motions of the various strokes in one's own room, a sort of drill routine, in which hand, leg, and eye take part.

Practice should always be carried out as far as possible under match conditions; the popping crease should be marked, and the batsman should be careful to take "guard" at the distance from the wicket which he finds most suitable to his style. As a rule the mark should be made about 3 ft., a bat's length, from the wicket; some men like to take it nearer to the crease, but the distance mentioned is long enough to obviate any danger of hitting the wicket, while the nearer one gets to the crease the greater is the danger of shifting the foot over it, and so running a risk of being stumped. But what one's custom is in a match, that must it be in practice.

Position.—A correct position is very important, even though some men who are really fine batsmen adopt a very unorthodox pose. It must be firm, yet easy. The following instructions may help the beginner. Take "middle-and-leg" guard [*see* GLOSSARY] about twelve inches behind the popping crease. Set the bat lightly on the mark where the "block" is, the face towards the bowler. Place the toe of the right foot so as just not to touch the inner edge of the bat, and parallel to the crease; the foot will then be just clear of the wicket. Set the left leg about fifteen inches in front of the right, the toe pointing slightly towards the bowler, the two heels being in a line at right angles to the crease. The weight of the body should rest entirely on the right leg, not on the bat or the left foot; indeed, only the left toe need touch the ground, and that lightly. The right knee should be straight—this is most important—and the right leg as rigid as a bar of iron. The left shoulder should be brought well across the body in the direction of the bowler. The correctness of the attitude may be tested by lifting the bat and the left leg off the ground together; if the batsman can stand still without swaying, his

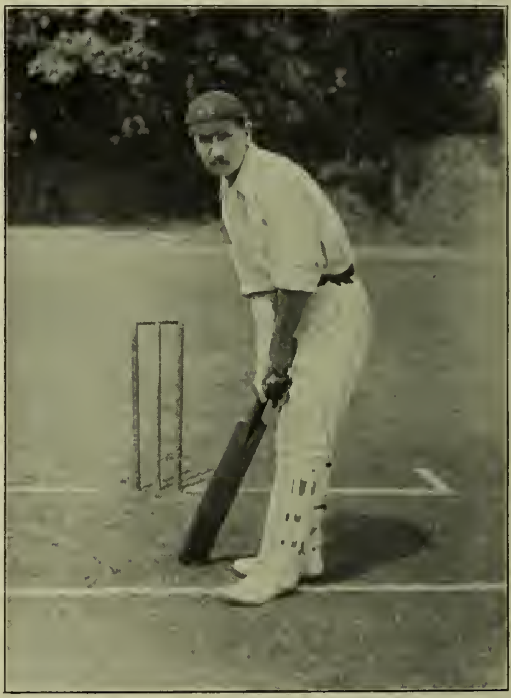
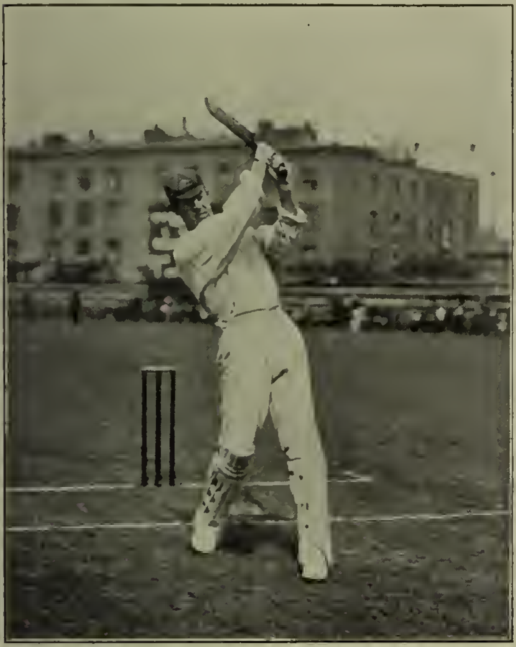


FIG. 4.—J. T. TYLDESLEY.

balance is correct. The body must naturally bend over the bat, *but from the waist, and not the knees,* and none of its weight must rest upon the bat. On the immobility of the right foot and the freedom with which the left moves, the batsman's success largely depends.

Even so simple a thing as holding the bat can be done in a wrong way. Grip the handle of the bat with the right hand about the middle; the grasp must be as tight as possible, and must never be relaxed. All four fingers must clutch the bat, the thumb resting just below them, the knuckles of the clenched fist being towards the bowler. The grip of the left hand must not be too tight; the knuckles are towards the batsman and the back of the hand towards the bowler, while the end of the handle rests in the palm, against the ball of the thumb, the handle being practically a prolongation of the left arm. Both the grip of the bat and the pose of the batsman should be carefully noted and practised in private, the bat being swung about in the direction of an imaginary ball. The various strokes mentioned hereafter may also be tried when the wrist and arm are familiar with the feeling of the bat, and it will soon be found that the right hand is the executive hand, and gives force to the stroke, while the left guides the bat, and may be called the "directive" hand, the importance of which will be seen in the next paragraph.



[*Photo. by G. W. Beldam.*

MR. V. TRUMPER. FINISH OF DRIVE.

"How beautifully straight his bat is!" is a remark often made about a good batsman. As a matter of fact "upright" would a more correct term that "straight"; but "straight" is the almost invariable epithet, and this "straight bat" is the first thing to be mastered by the novice, as it is the primary essential for sound cricket, offensive and defensive. Only batsmen of special natural advantages can afford to play with a horizontal bat, and even they often lose their wickets in consequence. The bat, then, except for certain strokes which will be described, must be kept absolutely perpendicular, and it will be found by practice that the *left* hand is called upon to do this part of the work and to correct the vigour of the right hand. More will be said on this subject when "back-play" and "forward-play" are being dealt with, but for the present, attention may be called to Fig. 4, in which the batsman is standing in position ready to receive the ball. No criticism of his pose is necessary, except that his weight *appears* to be equally distributed on either leg, whereas the left should bear none of it. If a left-handed bowler is bowling round the wicket, the left foot may be brought further across the wicket, and the left shoulder may follow it. The shoulder should always be over the foot.

Tabulating these remarks for convenience of reference, we may lay down the following rules:—

I. Grip firmly with the right hand, less firmly with the left.

II. The right toe should be just clear of the wicket.

III. All the weight of the body should be on the right foot, none on the left foot or bat.

IV. Both knees should be kept straight.

V. The left shoulder should be brought well across the wicket.

VI. The bat must be kept perfectly upright for nearly all balls, always for those which are straight or nearly straight.

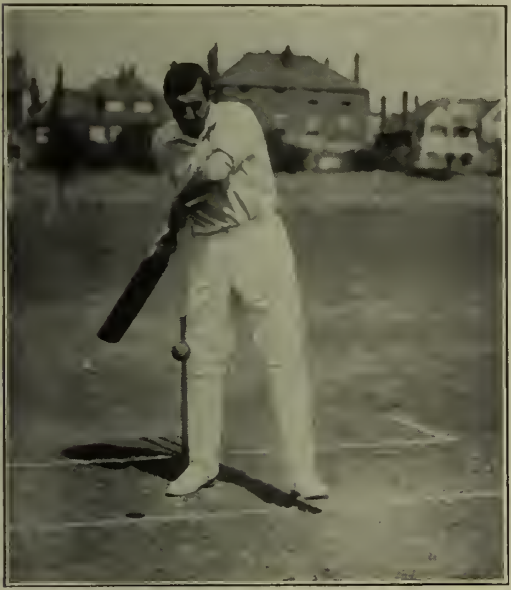
No spare moments will be wasted that are spent in lunging about with the bat, hitting at imaginary balls, straight and crooked; by this means the wrists will become supple and will learn to work together, a most important point. Two things, however, will be noticed—or should be noticed—first, that it is not easy to keep the bat upright even when the imaginary ball is straight; second, that the point of the bat naturally flies up, so that the ball, if struck, would be hit into the air, and the batsman run a risk of being caught out. With regard to the first point, the question of balancing the body on the right leg is all-important, as the left leg is then free to move in any direction, and it will be found that by advancing it in the direction of the supposed ball, the body going with it, the bat can be kept perfectly straight, and will meet the ball flush with its face. Further, by transferring the whole weight of the body from the right to the left leg at the moment when the ball and bat meet, the bat will receive a considerable share of that weight and impart it to the ball, the result being a much more vigorous stroke. But it must be especially remembered that under no circumstances (except as detailed on pp. 454 and 455) must the right toe be allowed to leave the ground; as, if the toe is in the air, however little above the turf, the batsman is out of his ground, provided no other part of his body, or his bat, is properly grounded. By shifting the left foot, as described, it will be found that not only can the bat be kept " straight " for balls a foot or more outside the off-stump, but also that additional power can be put into the stroke.

To deal with the second point. It is difficult at first to reach far forward without raising the point of the bat and hitting the ball into the air. Some men, when playing forward, avoid this by turning the left wrist outwards as they lunge forwards, and bringing the back of that hand against the wrist of the right hand. The movement is very simple, and soon becomes mechanical, but more will be said of this under " Forward-Play " (p. 453). The second and greatest aid towards " keeping the ball down," *i.e.*, preventing it from going in the air, is to thrust the left shoulder towards the direction of the ball as the left foot goes out, almost pointing the shoulder at the ball itself. This is not very easily described, but any good cricketer can make the matter clear, practically, in a moment, and even the novice may teach himself by following the instructions given.

Thus far it has been assumed that practice has taken the form of a sort of drill; now we may pass on to the moment of encounter, describing and explaining the various recognised strokes and the methods of making them. It may be premised that the bat should in all cases strike the ball and not be struck by it, and that the ball should be met, if possible, with the lower part of the blade, as thereby the " driving," *i.e.*, the propelling, power of the bat is utilised to the best advantage. As it will be necessary to use several technical terms connected with bowling, it will be convenient to explain them here, reminding the reader that the " off-side " is on the opposite side to that on which the batsman stands at the wicket, usually on the left of the bowler, and the " on-side," or " leg-side," therefore as a rule on the bowler's right. When (in the case of a right-handed bowler to a right-handed batsman) the ball " breaks " (*i.e.*, twists) from the off-side towards the wicket, it is said to " break back," when from the leg-side, to " break from leg." A " full pitch " is a ball which the bat meets before it touches the ground. A " yorker " (or " tice ") pitches on, or within six inches of, the popping crease; a " half volley " from one to two yards in front of it; a " length-ball " from one to two yards further back still; and a " long-hop " pitches yet nearer the bowler. In the case of an exceptionally tall batsman with a long reach, a ball is a half-volley even if it drops somewhat shorter than the distance given, and this is one of the advantages which height bestows. Each different class of ball, it will be observed, has a fairly large range, depending on the reach of the batsman. More accurate definition is impossible, especially as a ball may be a half-volley on a fast wicket, which is a good length-ball on a slow one. Experience will be the batsman's best instructor on these points, and he should also study the article on " Bowling."

Most strokes are in the main either defensive or offensive, though many combine both qualities. It is clearly the batsman's first object to prevent the bowler from getting him out, but there is no better way of doing this than by hitting the ball to the furthest possible distance. But as there are certain balls, which from their " length " (*i.e.*, the distance at which they pitch from the batsman) it is difficult, or impossible, to hit away, and as defence is paramount, they shall be dealt with from this point of view first. There are two classes of strokes, known as forward-play and back-play, the original object of which is to stop the ball from hitting the wicket. Many fine cricketers hold that back-play is the foundation of good defence; others are equally vehement in their support of forward-play. The temperament and physique of the individual alone can decide which he will, as a rule, adopt; but the taller the man is, the better is he adapted for forward-play, as his reach gives him an immense advantage over a shorter player.

Back-Play.—Fig. 5 gives an excellent illustration of the position for back-play. The ball has pitched rather short of a " good length," just outside the off-stump; the batsman has met it correctly, by drawing back his right foot, which his left foot follows, and by keeping a perfectly upright bat for the ball to encounter. The errors of the position are (1) that the bat does not appear to be *quite* straight, and (2) that if the left foot were more in front of the right, the batsman would run less risk of being "cut over" (*i.e.*, hit in the groin) if the ball broke back suddenly. It may be observed that this is one of the cases in which the right foot is moved, but it must be specially noted that it is still kept behind the popping crease. The illustration shows what may be called *quiescent* back-play, the pitch and rise of the ball not allowing the batsman to try to score off it, but a taller and more commanding man would have waited till he felt the ball touch the bat, and would then, by an instantaneous—almost electrical—movement of his wrists, have forced the ball away in front of him to some distance, instead of merely allowing it to drop against the bat, as in the plate. The position of the left elbow, cocked up in the air so as to keep the bat upright, should be noted; some batsmen exaggerate this position in their determination to play straight, and raise the elbow till it almost conceals the face; this, if a fault, is a fault on the right side.

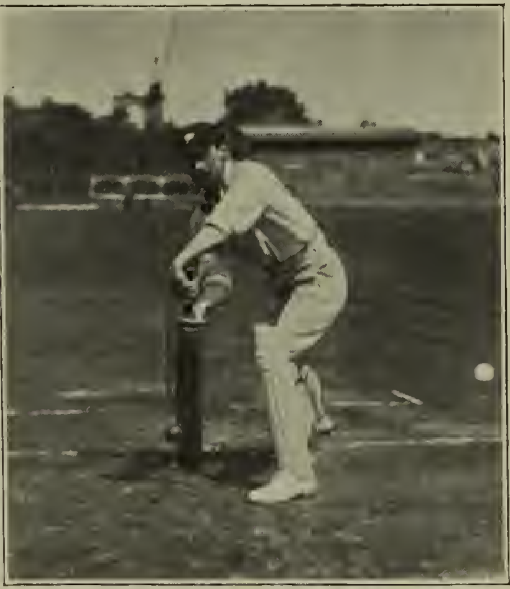


[*Photo. by G. W. Beldam.*

FIG. 5.—MR. C. B. FRY PLAYING BACK.

Forward-Play.—This style of play is adopted when the ball is pitched fairly close to the batsman, but is not so far up as a half-volley, which is the best ball to hit. Fig. 6 shows the position of the batsman at the supreme moment, when he has lunged out as far as he can reach, hoping to "smother" a somewhat over-pitched ball before it has time to rise or break. Observe that the left wrist has turned round, as explained on p. 452, that the left shoulder is pointed right at the ball, that the bat is perfectly upright, and that the point of it is kept back by the influence of the left hand, the left foot being advanced towards the ball, while the right toe is just on the ground. The weight of the batsman has been entirely transferred from the right leg to the bat and left leg, and if at the moment of transference the bat hit the ball, the latter will have been sent away at a considerable velocity. This description may sound very elaborate, but a few trials will prove that the position is easily attained, provided that the original balance is perfect and that the wrists work freely and easily together. The beauty of the whole stroke consists in the "timing" of the ball; and if the question is asked, "What is timing?" the only answer is that "When the batsman times the ball correctly, the whole power of arms, wrists, and body is thrown into the bat at the precise instant when it meets the ball; at this instant the ball will probably be just passing the left leg." A blow is perfectly timed at boxing when the fist encounters the opponent's face at the exact moment when the arm has straightened out; and the same remark applies to cricket.

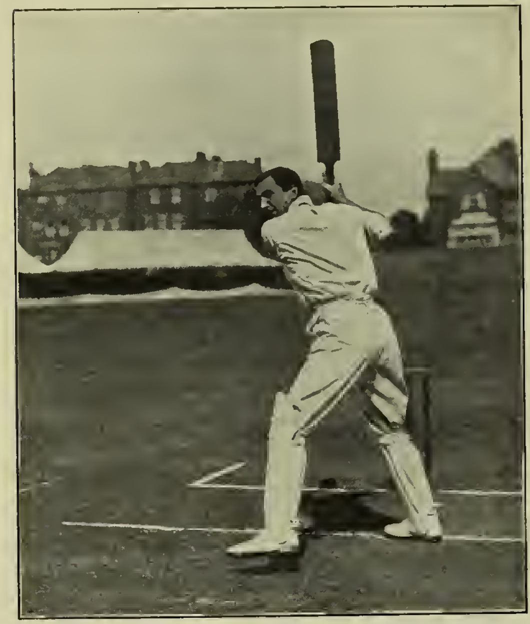
At this point the reader will naturally ask, "When am I to play forward, and when am I to play back?" As a definite answer is impossible, one must fall back on generalities, and say that, as a rule, on a fast wicket, a batsman of average height should play forward to all balls which pitch within two and three or, sometimes, four



[*Photo. by G. W. Beldam.*

FIG. 6.—THE HON. F. S. JACKSON PLAYING FORWARD.

yards of the popping crease; for a shorter man to do so with effect, the ball must be closer to him, and *vice versa* for a tall man; but much depends on the temperament of the batsman, the pace of the bowling, and the condition of the ground. Some tall men persistently play back, and lose the advantage of their height; some small men habitually play forward, and by overreaching themselves cause the ball to drop lifeless from the bat. On a fast, smooth, true wicket the ball will not rise much higher than the top of the stumps, and a comparatively short ball may then be played forward; but if the ground be slow or rough, the batsman, being in a somewhat more strained position than he is when playing back, will be unable to adapt his stroke readily to the vagaries of the ball, and back-play will be his best resource.



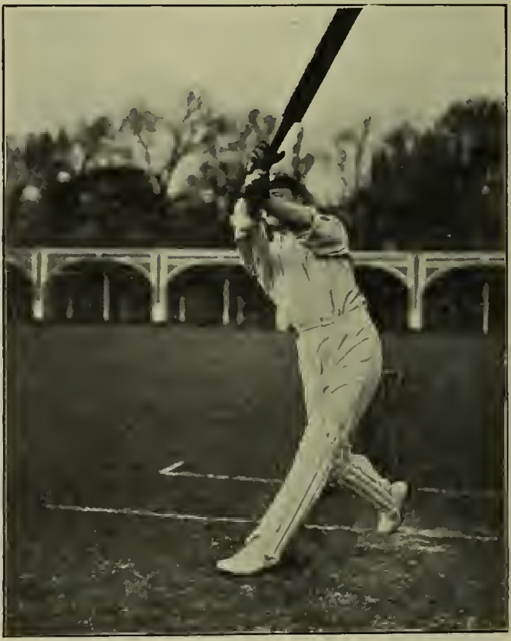
[*Photo. by G. W. Beldam.*

FIG. 7.—MR. C. B. FRY. THE BEGINNING OF AN OFF DRIVE.

Forward-play is the best way of meeting a fast bowler, as the ball has less twist on it than a slower bowler can produce. To play forward to slows is dangerous unless the ball can be " smothered " to a certainty.

A useful general rule is, " When in doubt, play forward on a fast wicket, and play back on a slow one." On a ground as fast as Lord's, in any time like favourable weather, it is always a rule of thumb to play forward rather than back. On a fast, true wicket, on which the ball does not rise higher than the stumps, runs may be got fairly freely, even off straight balls, by both styles of play, the forward stroke, if well-timed, driving the ball hard in front of the wicket; while by back-play a skilful batsman can place the ball between the fieldsmen in front of the wicket, or by a well-timed turn of the wrist at the moment the ball strikes the bat direct it along the ground through the slips; but it is impossible to make back-play as powerful as forward-play, as it depends on the arms and wrists alone, the weight of the body lending little help.

The Drive.—This, the most delightful of strokes, is the first genuine " hit " hitherto introduced, as the length-ball and long-hop, when straight, must be met by a stroke the primary object of which is defence. When, however, a ball is pitched nearer to the batsman than a length-ball, it becomes a " half-volley," and the batsman has a fine chance of making a big hit. To be bowled out by a half-volley is humiliating, to play forward and smother it is to lose a chance, to play back to it is probably fatal. The ball should be hit in front of the wicket with a good swing of the bat, the left foot being moved, as usual, in the direction of the ball (Fig. 7), and when the stroke is correctly made, every muscle of the legs, back, arms, and wrists seem to take part in it, and the ball flies off without an apparent effort, the bat following right through (Fig. 8). To time the stroke properly, the bat should meet the ball just as the latter is rising from the pitch. It adds force to the hit—besides enabling the striker to get to exactly the right spot—to jump in to meet the ball, even leaving

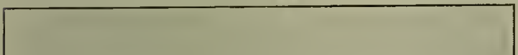


[*Photo. by G. W. Beldam.*

FIG. 8.—MR. R. E. FOSTER. THE FINISH OF AN OFF DRIVE.

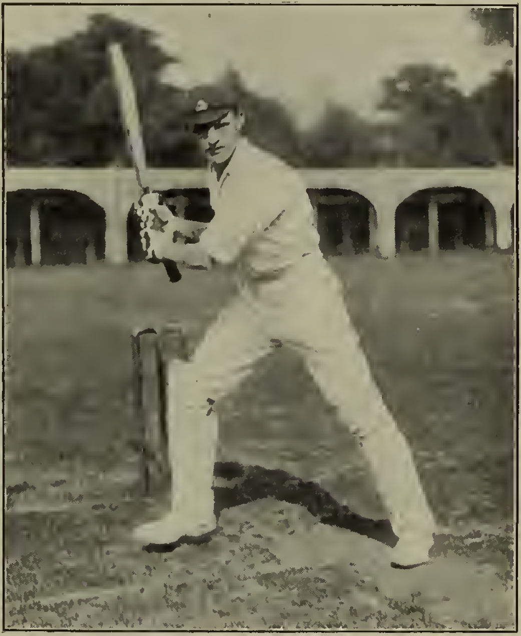
one's ground and taking the risk of being stumped, if the ball is missed altogether. This is exactly what the batsman is doing in Fig. 9, which, however, does not show the position of the feet at the moment of impact. When the down-swing of the bat has brought it against the ball, the right foot will close up on to the left, and the whole momentum of the body will be added to the swing of the arms and bat. One rule must never be forgotten: "Never jump out to drive a ball on the off-side." It is hard to keep the bat straight when the ball is, say, a foot wide of the off-stump; the chances of missing it are consequently greater, and the wicket-keeper has the easiest of opportunities.

To hit a half-volley all along the ground, the left hand must check the point of the bat so that it does not go beyond the left foot, but many batsmen in the exhilaration of the stroke let the bat complete its swing, and the ball soars away in the air in the direction of one of the "long-fields," who may, or may not, be able to catch it: the batsman has to take his chance of this, relying on the fact that it may be too far to the side of the fieldsman to be caught, or may fly fairly over his head; since, however, it is frequently hit to a distance of 100 yards before it drops. and has been sent by fine hitters as far as 170 yards, a little risk may fairly be taken. It is useful in practice to try to hit a straight half-volley straight back, either over the bowler's head or all along the ground to him. A crooked ball should be sent away on the same side as that on which it pitches. Probably more runs have been got off a half-volley than any given ball, and probably more batsmen have fallen a victim to its temptations, as not only may a fair hit be as fairly caught, but also any error of timing or any inaccuracy may send it high into the air.



[*Photo. by G. W. Beldam.*

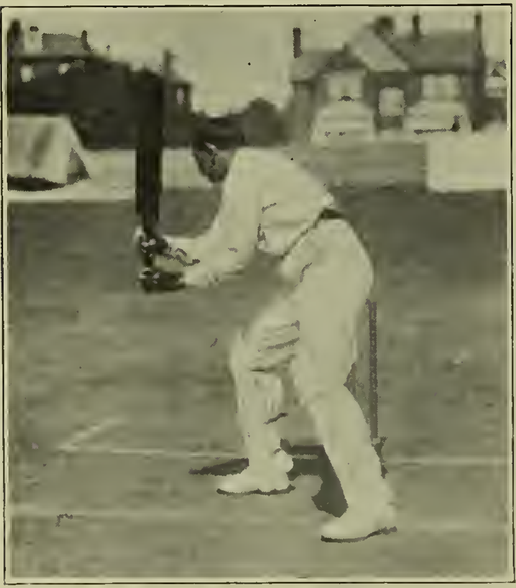
FIG. 9.—THE HON. F. S. JACKSON RUNNING OUT FOR A STRAIGHT DRIVE.



[*Photo. by G. W. Beldam.*

FIG. 10.—JAMES SEYMOUR. THE BEGINNING OF A CUT.

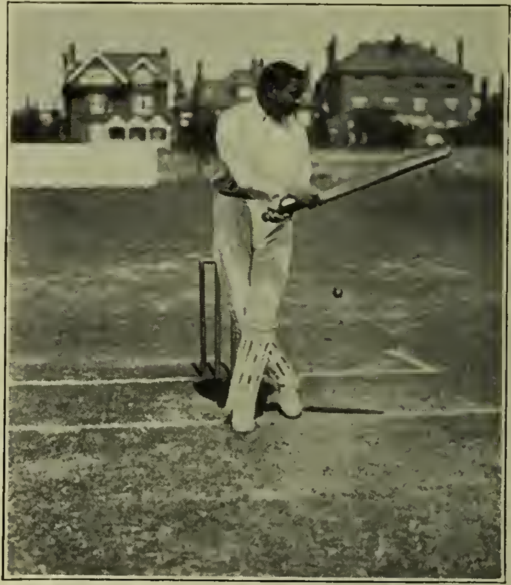
The Cut.—This is another beautiful stroke, which appeals to the experienced cricketer even more than the drive; the latter even the uninitiated can appreciate, as the sight of the ball sailing through space is easily "understanded of the people." The ball which the batsman cuts is more or less wide of the off-stump, and is generally short of a good length; indeed, many batsmen nowadays prefer to let the good-length ball go by, as the slightest error may send the ball into the hands of an expectant "slip." Figs. 10 and 11 show the batsman preparing to strike, and just after striking. In making this stroke several of our canons are violated; firstly, the right leg is shifted so as to take the batsman across to the ball; secondly, the bat is used horizontally and not perpendicularly; thirdly, the weight of the body is a negligible quantity, as most of the work is done by the wrists and fore-arm. It may help the reader who happens to be a fisherman to tell him that what he does perpendicularly with a two-handed salmon-rod, he does horizontally with a cricket-bat. The ideal ball to cut is a long-hop, not too short, about twelve inches outside the off-stump. Directly the batsman realises the situation, out goes his right leg, which should touch the ground at about the same moment as the bat hits the ball, or even a moment before, the two wrists moving the bat with a sort of "flicking" movement, impossible to describe, so that the ball is struck just as it has passed the right foot. It is a stroke which must be seen to be imitated; but if all goes well, the ball will travel square with the wicket, just past "point's" left hand, or even further behind it, as a clever "cutter" can place the hit with much precision. If the ball rises much—is a foot higher than the wicket, for instance—it should be left severely alone, as a catch is very likely to ensue. The cut is one of the few strokes made *across* the path of the ball; in most instances bat and ball travel along the same path, but in opposite directions. The cut is a difficult stroke to acquire; indeed, some batsmen never get proficient at it, and endeavour instead to hit the ball, still with a horizontal bat, in front of the wicket. Such a stroke is often incorrectly called a "cut," but it is rather a species of "drive." Great care should be taken to "keep the ball down" (*i.e.*, hit it along the ground), and in such a way as to make it skim the surface without bounding too high. If anyone finds a difficulty in "hitting" this particular ball, let him try "guiding it"; in other words, let him frame for the cut, and, as the ball passes the right leg, just lay the bat against it, without attempting to strike; the pace imparted to the ball by the bowler will hardly be checked, and many a run may be got by the stroke, while in process of time the man who has mastered this will master the cut, pure and simple, as well.



[*Photo. by G. W. Beldam.*

FIG. 11.—K. S. RANJITSINHJI CUTTING LATE.

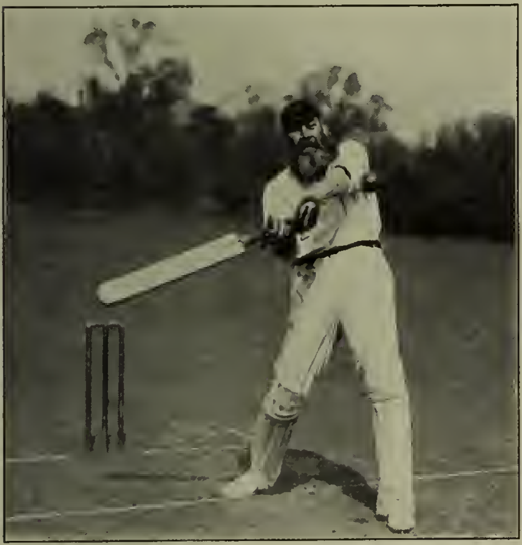
The Leg-Hit.—A ball which is well pitched up and would, if left alone, hit the batsman's leg, may easily be driven in front of the wicket to "long-on," or more squarely with the wicket; but when such a ball would pass just outside the legs a different kind of stroke is required, as the "drive" would be a physical impossibility. This class of hit is known as the "leg-hit," and it may be made even off balls which pitch straight for the wicket, or even on the off-side of it, but such strokes are not strictly orthodox, and demand special powers on the part of the batsman. They are dealt with under the heading of "The Pull."



[*Photo. by G. W. Beldam.*

FIG. 12.—K. S. RANJITSINHJI GLANCING TO LEG.

In the present day most bowlers try to get the batsmen out by bowling tempting balls on the off-side for them to hit into the air, and the result of the increased accuracy of bowlers is that very few balls are sent up which pitch on or outside the legs; hence leg-hitting, pure and simple, is, for want of opportunity, almost a thing of the past, except in cricket of a somewhat inferior grade. Still, as it is given to few to reach good cricket without a long novitiate, and as the leg-stroke is as delightful to the striker as to the spectator, a more than passing allusion must be made to it. The "leg-hit" covers a large range, and the various modes of scoring off a leg-ball are too numerous for exact description. The cricketer will find them out for himself, but a few general hints may be helpful. A long-hop on the leg-side may be hit away square, with a horizontal bat, which is the most drastic method of treatment; or the batsman may simply hold the face of his bat at an angle of about 45° to the ball's direction and allow the ball to strike it, when the pace imparted by the bowler will send the ball away behind and to the left of the batsman. Such a stroke is known as "the glance" or "the glide" (Fig. 12). This stroke is made off a ball of any length; and to men who are not good *hitters* to leg it is invaluable, as the ball, if the bowling be fast and the stroke made with accuracy, flies away to the boundary like lightning. In this case it will be seen that the ball hits the bat, and that its course is deflected by it, but this is not "hitting" in any sense of the word. The proper "leg-hit" is made off a ball which may vary in pitch from a "good length" to a "full-pitch," and in direction to a distance of about three feet from the batsman's legs and outside them. The rule for the stroke is simple enough—"throw your left foot towards the ball, and hit beyond the left toe as the ball passes." If such a stroke be well-timed, and catches the ball as it passes the toe, a delightful hit will be the result; all the more delightful because the striker may put his full strength into the "smite," and need not trouble himself about the risk of being caught. The ball flies away square or fine according to the pace of the bowling, and as it travels *behind* the batsman he cannot usually do much to control its direction or elevation, but as the range of the leg-hit is so large, he may trust to the chapter of accidents to escape being caught; one thing is certain, that if the ball is struck fair, the fieldsman is not likely to catch it, unless he happens to be standing in exactly the right place, for the hit, being more or less a "blind hit" to the striker, will also be a blind hit to the fieldsman, as he cannot place himself for it with any certainty.



[*Photo. by G. W. Beldam.*

FIG. 13.—DR. W. G. GRACE PULLING A SHORT LENGTH BALL.

The "draw," being obsolete, is only mentioned here for the sake of completeness. Old-fashioned players used to meet a short-length ball coming straight to the leg-stump with the bat inclined, as for the "glance," the ball being deflected between the legs and the wicket; it was a risky stroke, though some batsmen made it effective.

The leg-hit as described is made with a more or less horizontal bat which "sweeps" the ball away; but the bat may be kept perfectly straight and the body perfectly straight, the ball being struck just before it reaches the striker, whose left leg is drawn up close to the right; the resultant stroke, if accurately timed, is one of the most brilliant that can be seen, but it requires a combination of strength and accurate timing and exact length which is not to be met with every day. When all these requisites meet, a huge hit is the result.

Leg-hitting is more or less a natural gift, and some batsmen never attain it; for them the most effective stroke is the old "Cambridge poke"; no attempt is made to *hit* the ball, but rather to push or guide it, in front of the wicket or behind it, according to the position of short-leg, if there is one.

The Pull.—The term "pull" is applied to a stroke which is more practical than orthodox, and which brings a straight ball or an off-ball across the wicket to the on-side (Fig. 13). It is dangerous to the batsman, inasmuch as it cannot be done with a straight bat; to the bowler, inasmuch as it is more or less unexpected, and usually sends the ball to an unguarded part of the field; but the batsman is more likely to suffer than the bowler, and consequently the stroke can only be recommended to a batsman of large experience, who is also blessed with a quick, sure eye.

General Remarks.—The batsman's first object should be to defend his wicket; his second, to do what damage he can to the enemy by scoring runs. The two things may, however, be reasonably combined, and a defensive stroke if played with determination and power, may, and often does, result in the acquisition of runs. Hence every ball within a certain limit should be played hard; the bat should meet the ball, and not be struck by it, though in the contest between the hand and head of the bowler and the hand and head of the batsman, the former often has the advantage, and the latter has to be satisfied with merely arresting the ball's progress. " Shooters " [*see* GLOSSARY] are rare nowadays, thanks to the ground-keeper's care, but if they come, the batsman must be satisfied to stop them, and it is well, when playing forward, to keep the point of the bat so close to the ground as to smother a possible shooter. " Yorkers " do not lend themselves to scoring; they must be watched carefully, and most men play them by chopping down quickly at the place where they are going to pitch; but by playing forward—perhaps the best method—they may generally be met on the " full pitch "; in any case the batsman should be content with merely stopping them. What is a yorker to one player may by difference in reach be a full pitch to another.

In both back and forward-play the bat and left leg should be so close together that the ball cannot pass between them.

One of the bowler's devices is to bowl about a foot outside the off-stump, keeping a good length, to induce the batsman to hit more or less wildly at the ball, and to hit it into the air. The best way to meet this artifice is to hit the ball fair and square in the middle of the bat, and when the batsman is well set this may be done with success, but experience will teach him that great care is necessary, and that there is a ball of a particular length which cannot be struck at without danger. This rule, however, is reduced to an absurdity by some men, who refuse to " let go " at anything between a long-hop and half-volley, and who, when the intermediate ball comes, merely step in front of the wicket so as to protect it with their legs in case the ball breaks back. This may be magnificent, but it is not cricket; it is a loss of opportunity to let any off-ball pass without an attempt at a stroke, save that one which, if straight, should be merely played, without an effort to force it away; at the same time, the best and safest way of meeting a slow, leg-break bowler is to get in front of the wicket—thereby defending it with the legs—and to sweep the ball round to the leg-side, always supposing that the ball pitches on that side.

The batsman should always be comfortably settled to receive the ball before the bowler begins to run. He should, directly the bowler is in position, rivet his glance on the ball and never lose sight of it till it has struck the bat. Too much importance cannot be attached to this habit of observation, and " Be ready in time " is an invaluable maxim. If the bowler is fidgety at the post and bowls before the batsman is quite ready, the latter should draw away and refuse to play the ball; if the wicket is hit, no harm is done. If spectators, or one of the fieldsmen, are behind the bowler's arm, they should be asked to withdraw, as they may catch the eye of the batsman and distract his attention, as well as interfere with his sight of the ball; but the umpire is bound to stand so as to get a clear sight from wicket to wicket, and the batsman has no right to demand, as many do, that he should stand out of the line of sight.

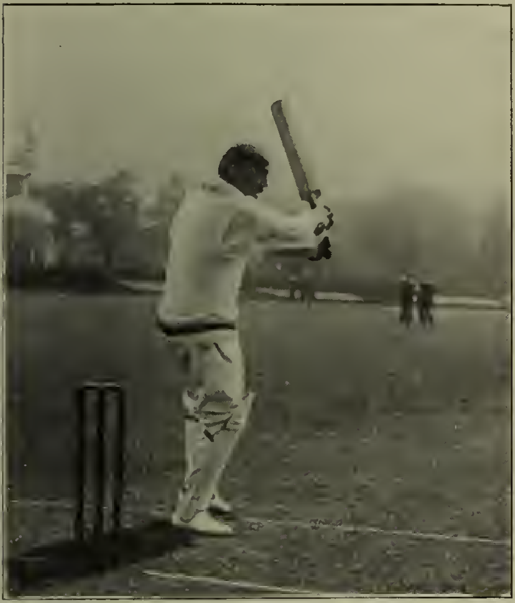
The art of running between wickets, without coming to a misunderstanding with one's partner, is indispensable. The rule is simple—the striker calls for all strokes in front of the wicket, his partner for all strokes behind the wicket. Some players make an exception to this rule in the case of a stroke to " third man," for the striker has a better view then of the direction of the ball than his partner; but even here the non-striker should have the right of calling the run, as his is the greater risk; but it is well to arrange with one's partner on going in who is to call for the stroke. Directly a ball is struck the batsman—whether striker or non-striker—whose business it is to call, should shout—sharply, quickly, and distinctly—" Come ! " " No ! " " Not yet ! " as the case may be. It is well to add to the word " Come ! " the number of runs that seem likely to be got for the stroke—*e.g.*, " Come one ! " " Come two ! " and the like; in fact, every information should be given to one's partner that may help him in running, but in all cases it

[*Photo. by G. W. Beldam.*

W. RHODES.

should be regarded as a golden rule that the man who runs the risk of losing his wicket has the right of calling or refusing a run. If the non-striker has to call for a sharp run, he should be prepared to stop, as the striker may not be in a position, especially if his legs are far apart, to start at once.

The non-striker should always "back up," *i.e.*, should always follow up the ball for a yard or two towards the striker's wicket, so as to get a good start in the event of a possible run, but he must be careful not to leave his ground till he has *seen* the ball leave the bowler's hand [*see* LAW 35], nor to go so far that he cannot regain his ground in case the ball be driven straight back, for then, if he has not made good his ground and the ball, having first touched the bowler, hits his—the non-striker's—wicket he would be run out. With a hard-hitting partner it is well not to "back up" too far as there is a danger of being struck, if the ball is hit hard.


[*Photo. by G. W. Beldam.*

MR. A. C. MACLAREN. THE FINISH OF A SQUARE CUT.

If a misunderstanding occurs between the batsmen when running, the one who has made the mistake should give way and allow himself to be run out, but there is a generous feeling among cricketers that the worse batsman should sacrifice his wicket in the interests of his side, even if the error is not his, and that the batsman who is "well set" should be the survivor.

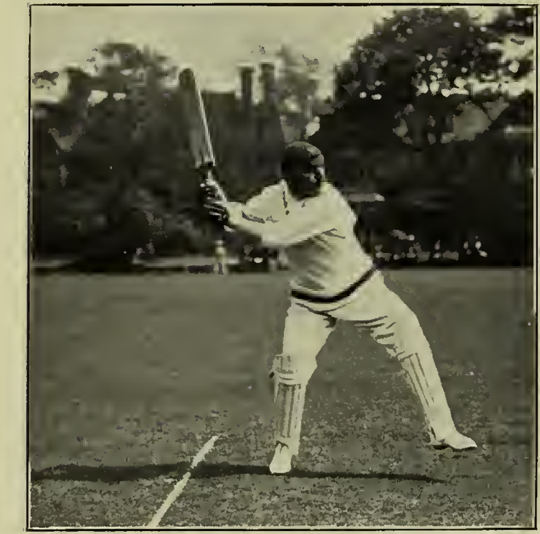
The fieldsmen should be carefully watched by the batting side, both when actually batting and in the pavilion, to note and record which are good fieldsmen and good throwers, and which are left-handed men. If the ball goes to the "wrong" hand, a run may often be got; or to a man who is standing a long way from the wicket and has been noted down as a bad thrower.

Some batsmen are famous for "stealing" runs (*alias* "running short runs"), when the ball is only hit a very short distance. This practice, it is true, often demoralises the fieldsmen, but usually does more harm to the batsmen, who run themselves out of breath and are very liable in the excitement of the moment to commit an error of judgment which results in the loss of a wicket. It is a bad speculation to risk a wicket for a run, and the worst way to get a run is to run out one's self or one's partner.

Every batsman should jealously inspect the condition of the turf at his wicket when an over is concluded. Fragments of grass and turf should be removed, as likely to make the ball "jump" or "shoot"; on a soft wicket the marks made by the ball should be gently tapped flat with the end of the bat; if the turf is very soft, it is a mistake to hammer it with the back of the bat, as such a process makes a pulp of the ground in the immediate neighbourhood.

All superfluous "flourish" is fatal to good "timing"; such flourish may appear very graceful to ladies and such spectators as do not understand the game, but to the cricketer's eye it is not only a meretricious, but a dangerous ornament, especially when the wicket is "tricky"; and this seems a convenient opportunity for saying a word on the different conditions of the ground, and their effect on batting and bowling, for in the natural course of events what is good for the bowler is bad for the batsman, and *vice versa*.

The condition of turf which the batsman loves—and the bowler dreads—is produced by a succession of hot days on a smooth, level, close-shaven ground, on which the grass is not too thick. On such a wicket the bowler is comparatively powerless, as he cannot make the ball break to any appreciable extent; and it comes true and fast, never more than about a stump's height from the ground, so that the batsman need not worry himself about eccentricities of curve, but can, and should, play boldly forward at every ball which is not a long-hop. A thunder-shower may change the whole course of procedure, if the sun shines hot and bright when the tempest has passed. At first the ground, wet on the surface and hard underneath, gives the bowler no help—especially as the ball is wet, and his footing precarious—while the ball "cuts through" the wet surface, and comes up to the bat fast and easy; but when the sun begins to tell, and the wet surface begins to cake, then the batsman's troubles begin, and the ball "breaks," "shoots," or "jumps," like an animate fiend, and sound cricket is almost impossible. Under such conditions the batsmen should run a few risks to score runs quickly (in cricketers' parlance, "to force the game") while they have the chance, and the judicious captain will send in his hard-hitters, with orders to get all the runs they can in the shortest time. It is hardly incorrect to say that a side, which might be expected to score 400 runs on such a wicket as was first described, would be well satisfied with 120 on a caked and crusted wicket, affected by rain and sun. A soft wicket, especially if the grass is still wet, is an easy one, from the batsman's point of view. It is of course hard to make the ball travel on the slow turf, and the bowler may be able to make it break considerably, but it comes so slowly from the pitch that the batsman has no difficulty in watching its eccentricities, and runs come surely, if slowly. Probably there is no condition which delights the bowler's heart more than the "crumbly"—when a wicket, once hard and true, has begun to wear, and has a broken, dusty surface. At such times the ball gets a good grip of the crumbling surface, and not only dances about like an acrobat, but dances so fast that scientific cricket is difficult. Here, again, the batsman must realise the condition of affairs, abandon cricket "by the book," and hit out (not indiscriminately, but fearlessly and boldly) on the smallest opportunity. On this, as on the "caked" wicket, hay must be made while the sun shines, but whereas the "caked" wicket may recover, for the "crumbled" there is no hope.


[*Photo. by G. W. Beldam.*

MR. A. C. MACLAREN JUMPING OUT TO DRIVE.

It may be useful to remind the reader at this point that the remarks made about the batsman apply equally, but in a reversed sense, to the bowler. What is good for one is bad for the other, and as the contest is *à outrance,* each should make himself acquainted with the tactics of the other, so as to meet, and, if possible, defeat them.

W. J. FORD.

Batting.—A good and easy position at the wickets is highly important; by "good" being meant such a position as experience has shown to give the batsman the best chance of combating the bowling; by "easy," a pose which is in no way stiff or constrained, but allows the player to move arms, legs, wrists, and the whole body with readiness and freedom. As to the placing of the feet, sufficient has been said before (p. 450), though it may not be amiss once more to emphasise the importance of keeping all the weight upon the right leg when preparing to receive the ball. Any weight upon the left must delay, if only for a moment, that rapid advance of it upon which, to a large extent, correct timing must depend. As to the hands, the left hand should grasp the bat so near the top that the ball of the thumb rests against it, and the right hand should be brought up as close as possible, provided that the left be allowed to twist round without catching the glove, when the batsman plays forward. There is nothing that cramps the style more than a grasp too low down the handle, and the best that can then be expected is a dogged defence.

It is impossible to lay down general rules as to when back-play or forward-play should be employed. On this question it is hopeless to expect complete agreement, and all that can be done is to state one's own practice, without any dogmatic assurance that it is necessarily the best for all. It seems to me that the school of cricket that was supreme, roughly speaking, from 1875 to 1885, was too sweeping in its advocacy of forward-play, and looked upon back-play as a mere device for defence, instead of being, what it may often be, a most rapid and effective way of scoring. Of course, to a fast ball well pitched up, say, dropping six yards from the wickets, it is almost necessary to play forward, but to a batsman blessed with a good eye and supple wrists, the extra two or three yards, through which a short-pitched ball may be watched, give a very great advantage. In playing forward, one is compelled to trust to the judgment formed from the flight of the ball before it pitches, and the bat itself obscures the sight of sudden developments.

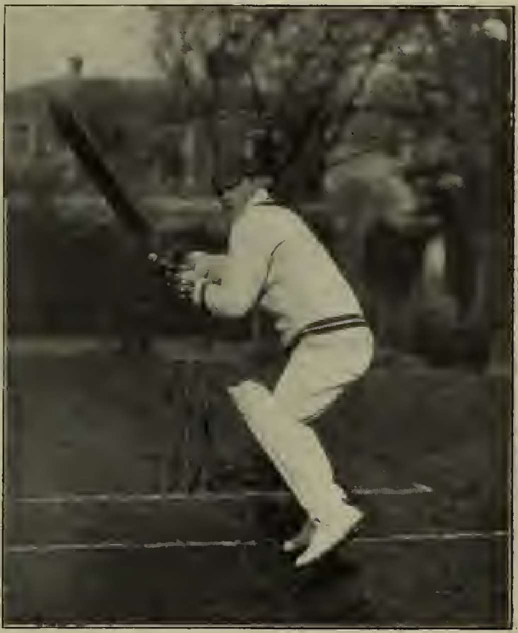
In playing back, one must be prepared to draw the right foot back freely and promptly. The absolute fixity of that leg is undoubtedly a golden rule for the beginner, but it is a mistake for the experienced batsman to regard it as a law which may in no case be broken. Let him, if resolved to play back, slide the right leg towards the wicket, *not* putting it in front of the stumps, and always remember to keep the bat and play the ball, *in front* of that leg. This will save him from all danger of hitting his wicket.

The cut is a stroke which is certainly not used to the extent that it deserves, and this for two reasons. The first is the modern habit of letting balls go by upon the off side that seem at all dangerous, without the least attempt to hit them. The custom has grown almost to an absurd extent, and bowlers, encouraged by the timidity of the batsman, send down unharmed ball after ball which ought to yield plenty of runs. As a general rule one may say, " Never let an off-ball pass without striking at it, if it be within anything approaching to easy reach." If the batsman step well across, and get fairly over the ball, he has every chance to score, and if it should bump, he has complete control of the bat, and should be able to avoid a dangerous stroke. One may often see a batsman let off-ball after off-ball pass his wicket, and then, at last screwing up his courage, hit one, precisely similar, to the boundary, a feat which he might have performed earlier with much advantage to his side.

The second reason of its rarity is the small attention that the majority of batsmen pay to the placing of the ball in the stroke. Most men are content to cut it square, or almost square, direct to the hands of point or third-man, who find little difficulty in dealing with it; but if a little more care were taken. and the ball struck a fraction of a second later, it would be quite as easy to steer it safely through the slips.

In leg-hitting, one of the chief things to remember, when a ball is coming upon or outside the legs, is that a long innings is a very exhausting business, and that it is a waste of energy to smite furiously at the ball, when a slight change of its direction will secure the object equally well. There is no more effective stroke on the leg side than the " glide " or " glance." To make it, put the bat well forward, not square with the course of the ball, but at an angle that will vary with the direction in which the ball has to travel after the stroke so as to avoid a fieldsman. Just as the ball touches the bat, a quick turn of the wrist sweeps it well away behind the batsman, and, in the stroke, the whole body should pivot upon the right toe, as in the conclusion of a golfing drive.

Some men have the dangerous habit of jumping round to a leg ball, instead of swinging upon the right leg; it is dangerous, because, when bowler and wicketkeeper understand one another, the former may deliberately send a ball up to the dancer upon the leg-side, and put him in great peril of being stumped while his right foot is in the air.



[*Photo. by G. W. Beldam.*

MR. G. L. JESSOP JUMPING OUT.

The " pull " also is a stroke which every batsman should learn, as there is none more demoralising to the bowler, and none more necessary to have at one's command when the wicket is very bad, for naturally, as this stroke sends the ball where it has no right to go, it finds a place where a fieldsman has no right to be, and therefore scores. At the same time, though an important stroke, it is most dangerous, and requires to be conducted, as all others, under rule. One may assume that any first-class batsman can pull a very short-pitched ball with ease and safety, and place it where he likes, and much the same applies to the full-pitch, unless it be very fast, but the difficulty arises when the ball is of a fairly good length. One should *never* attempt to pull a half-volley, for the risk of being bowled is enormous, but if the ball be a little short of it, and a pull be necessary, throw the left foot right across the wicket, and sweep the bat round the toe, taking especial care to keep the ball down.

There is perhaps a danger that batsmen may get too orthodox, and throw away possible chances of winning a game by a refusal to take any risks at all. As a general rule, especially if the wicket be bad, and not likely to improve, it is well to hit at almost everything. Three fours in five minutes, and then retirement, will do more to help a side than remaining at the wickets for an hour for ten, even though the difficulties faced and surmounted may have been enormous; for there is very little chance on a bad pitch of the bowlers getting tired out. There is, however, one moment at which the average batsman is a little too much inclined to force the game, and that is when a lob-bowler is put on, but there is no more reason for contempt than there is for the panic that he occasionally inspires. To every ball well pitched up the batsman may fearlessly walk out, take it on the full-pitch, if possible, and place it along the ground for a single or a two. If the bowler pitch them short, one may step back and gently place them where seems best; the only dangerous method is that which tries to secure enormous hits off every over.

If, however, the batsman should wish to make a big drive (and this applies to all bowling, not merely to lobs), by all means let him jump in to meet the ball, so as to get it on the half-volley. Some advocate the "fast-footed" style of hitting, but though this makes the risk of missing the ball slightly less, it is almost impossible, as the ball is met on the rise, to prevent it from soaring. It may go over the fieldsman's head, but the risk of giving a chance is great. By jumping in to meet it, the batsman hits the ball at the moment when it pitches, and, the body being well forward, he is less likely to get under it.

A word may be useful as to fielding at those difficult places, point and short-slip. Slip should never take his eyes off the ball, from the moment the bowler starts his run to the time when the ball is safely held. He should not attempt to watch the batsman at all. Point, on the other hand, if the bowling be fast, does well to draw conclusions, from the way the batsman is framing, as to the direction of the hit. Both should make every experiment possible in order to find exactly what distance from the wicket suits them best to stand. Many a man finds out that at a particular spot he can take the ball with fair certainty, but that if he stand a yard or two nearer, or further away, he is almost helpless. It is well to remember that the ball can only be caught by the *fingers*, as near the palm as possible, and that it should never be allowed to hit the palm, for from there, in all probability, it will bound off to the ground. In any case, let the hand be beneath the ball, and never try to grasp it from the top, or sideways.

K. S. Ranjitsinhji.

Left-Handed Batsmen.—The appearance of a left-handed batsman is always an aggravation to the fielding side, and his dismissal is generally greeted with corresponding signs of gratification. As will be seen hereafter, it is not so much the number of runs he makes, as the general effect he produces on the *moral* of bowler and fieldsmen, which influences the state of the game. The incessant and necessary change of position whenever an odd number of runs is made by a hit is as trying to the temper as it is to the physique, and as demoralisation, more or less temporary, is likely to follow, it is perhaps fortunate that these sinister cricketers are not numerous: they are certainly not beloved of the opposition. Among individuals the trouble and responsibility are most severely felt by bowler and

Mr. W. Bardsley.

wicket-keeper. The latter always seems to find an increased difficulty at his post, as a proof of which it is not uncommon to find him standing back for the left-hander, but close to the wicket for his companion, as the whole game has now become "wrong-handed" for him, and many a snick from the left-hander's bat is allowed to pass, when the right-hander might not have escaped. Even short-slip and point sometimes find it less easy to follow the ball as it leaves his bat. But it is the bowler on whom the chief difficulty falls. A special mental effort is required of him, created by the task of ridding his side of the obnoxious player. He is troubled in various ways. Accustomed to pitch the ball persistently on the off-side for a right-handed man, he has now to suit himself to the altered conditions, and to pitch the ball on the leg-side. Easy enough for a ball or two, no doubt, but when singles are being rapidly made, and the bowler has constantly to alter his tactics and the direction of his bowling, length and pitch are apt to suffer, to the benefit of both batsmen. Many right-handed bowlers cannot bowl over the wicket to left-handers, and they are seen bowling round the wicket to the one batsman, but over to the other. A left-handed bowler especially dislikes bowling to his left-handed opponent. The reason is simple enough. His favourite break-back is eminently liable to be "pulled," and to avoid this he will generally be found bowling over the wicket to the left-handed instead of round—a practice which is quite novel to him, and correspondingly difficult. To the best bowlers these difficulties may be comparatively slight, but it is not uncommon for a good captain to take a left-handed bowler off when a left-handed batsman comes in, often to the advantage of the latter's colleague. It is to such constant yet necessary changes as these that the left-hander owes his advantage—changes which help to demoralise the man and spoil his bowling.

Mr. V. Ransford.

A left-handed batsman enjoys a reputation for certain strokes as being peculiarly his own. In particular, he seems to have many more driving strokes—not *cuts*—that range between third man and extra cover, than have right-handers, due perhaps to the fact that a ball breaking away to the off is better adapted to this class of stroke than a ball coming in from the off. As left-handers for the most part meet right-handed bowlers who break back, they naturally get more practice for such strokes, and develop their talent in that direction accordingly. For off-driving purposes a right-hander certainly prefers a left-handed bowler, who makes the ball go away from leg to off, and similarly the left-hander loves medium-paced, right-handed bowling, which he meets so frequently that constant practice thereat has made these off-strokes a prominent feature of left-handed play.

One service in particular the left-hander is specially adapted to lend his side, and that is the checking of the successful attack of the slow right-hand bowler who bowls with a strong break from leg. The right-hander who steps in to drive takes two risks—the risk of a "miss-hit," and the risk of being stumped, the chance being generally quite simple; but the left-hander, if he misses the ball, has a second line of defence to fall back upon, viz., his legs, and if the ball does come to the wicket-keeper, the chance, being probably on the leg-side, is neither very visible nor very easy.

Hence it is not merely the left-hander's score, but his mere presence, that fieldsmen resent, and should his stay be a long one, he may materially alter the course of the game. No side is quite complete without such a batsman, if he be of good quality, though there are not many first-rate left-handers to be found. It is politic to send one in to bat, *cæteris paribus*, if it is desired to spin out time; and, on the other hand, he should not be sent in, even if a fast scorer, when time is precious, as many valuable moments are lost during the necessary chopping and changing of the field.

F. G. J. FORD.

Bowling.—An excellent and instructive paper on the subject will be found appended, from the pen of T. Richardson, the famous ex-Surrey and England fast bowler, who was also a member of A. E. Stoddart's Australian Eleven, whilst the subject of the up-to-date "googly" is specially dealt with by B. J. T. Bosanquet. The questions of "length," "break," and "accuracy" are exhaustively dealt with by the former, but as he dwells mainly, and naturally, on fast bowling, a few lines on other points may not be out of place.

Bowlers are classified (1) according to their action, as "Under-hand," "Round-hand," and "Over-hand" (the word "arm" is often substituted for "hand"); and (2) according to their pace, as "Fast," "Medium-paced," or "Slow." In "under-hand" bowling the arm is not raised above an angle of 45° from the body; in "round-arm" it must not be lifted more than 90°; if the arm is raised higher, the bowler is an "over-hand" bowler. At different times legislation restricted and limited the height to which the arm might be raised; at present there is no limit save that imposed by Laws 10 and 48.

So little is seen nowadays of fast under-hand bowling that the batsman who suddenly encounters it often is "surprised" out. The real difficulty lies, not in the bowling itself, but in the meeting of it; the eye, accustomed to look up towards an upraised arm, does not at once accommodate itself to the altered conditions which suddenly require it to look down; consequently the golden rule already given of "Watch the *ball* from the moment the bowler begins to run" will be found invaluable. It is rarely met with except in rustic matches, where some village champion often defeats cricketers of a high class; as a matter of fact, he "surprises" them out, or they get themselves out by their own carelessness, or by contempt for the bowling. Most fast under-hand bowlers bowl a large proportion of "sneaks"—balls which seem to cling persistently to the ground, sometimes with an awkward curl or break. The best way to play them is to watch them well, to "place" them if crooked, and to play out or hit out with the point of the bat close to the ground. If they only bound once, they seldom rise more than half-stump high, and may be played with the utmost ease; if they are "many-bounders" hard forward play will always meet the case, the only risk being that of being caught by the bowler, or mid-on, or mid-off; judicious "placing" on the leg-side will secure many a run.

No slow bowling should be played "fast-footed"; in other words, the batsman should always be ready to step or jump in towards the pitch of the ball, *unless it be on the off-side* (*see* p. 455), but when "lobs" are introduced the batsman can do as much with his feet as with his hands. "Lobs"—slow under-handed bowling—are invariably terrible to the timid batsman, partly because a certain amount of humiliation is, without any reason, attached to a failure to cope with them; yet good lobs require as much care and pains as any bowling. In pace they should vary with every ball, and both leg-break and break-back—especially the former—are to be looked for, but, as bowled nowadays, they have seldom a great deal of spin, and should be met on one absolute principle—"hit them on the long-hop or the full-pitch." In the former case the batsman keeps himself back and "places" or "pulls" them; in the latter he runs out, and—does the same thing. To play forward is dangerous; to hit them on the half-volley is delightful, but entails a certain amount of risk. But in no point of cricket is so much individuality displayed as in the playing of lobs.

[*Photo. by G. W. Beldam.*

T. WASS. FAST RIGHT-HAND.

It may seem strange to have included the last two paragraphs under the head of "Bowling," but instructions to the batsman are in an equal degree instructions to the bowler, if they be read aright; consequently it will be the lob-bowler's aim to keep so sound and true a length and such a pace, as to induce or compel the striker to play forward. Nothing, however, should be so disconcerting to a lob-bowler as to be consistently placed past the fieldsmen for a single. A half-volley hit to the boundary should inspire him with hope, but a series of well-placed singles should convince him that his efforts are vain.

T. RICHARDSON. FAST RIGHT-HAND.

It may be added that a lob-bowler who depends, as most of his kind do, on the leg-break requires but few fields on the off-side; point, short-slip, and third man may be compendiously represented by a sort of third man, about six yards from the wickets.

We may now pass to the classification of bowlers according to their pace, premising that the words "fast," "medium," and "slow," refer to the *general* pace of the ball as delivered. A "fast" bowler may bowl one "slow" and one "medium" ball per over, and a slow bowler one "fast" and one "medium," but the pace of three balls in the over will be "fast" in the former case, and "slow" in the latter.

Fast Bowling.—The fine batting and good wickets of the present day are doubtless the cause of the improved condition of modern bowling, but the acquisition of the art demands not only long and patient training, but a physical capacity and natural aptitude such as are not given to every man. Further than this, nerve, good temper, and pluck are quite indispensable. It is a question whether he who bowls well as a boy also bowls well as a man, as the attendant strain is certainly severe, but the writer certainly developed in youth some of the break and spin which helped him to his later successes.

The first thing to learn is to bowl straight and to bowl a good length, and this power is probably natural and not acquired, though nature requires the assistance of perpetual practice. But the bowler, whether born or made, should cultivate or acquire a high action and a good swing of arm and body, as such a delivery will make the ball rise quickly and perpendicularly from the pitch; but the action must at all costs be easy and free, qualities which neither imitation nor education must allow to disappear.

For early practice nothing is better than to bowl, the arm raised as high as possible without strain, at a disc of paper, the size of a crown-piece, placed at the proper distance from the wicket. It is impossible to state exactly what this distance is, as it depends on the pace of the bowler and the nature of the wicket, to say nothing of the

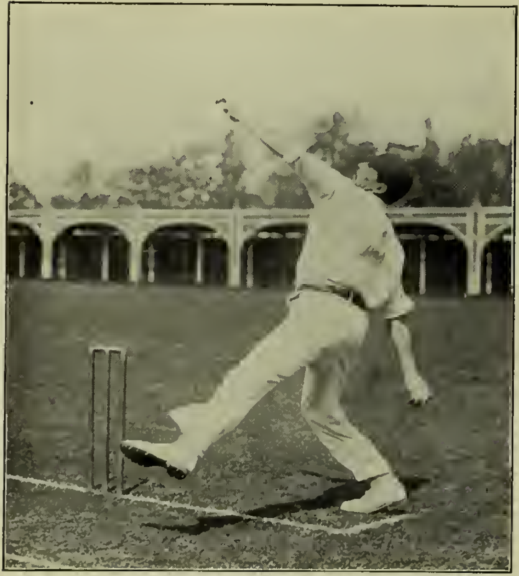
[*Photo. by G. W. Beldam.*

MR. W. BREARLEY. FAST RIGHT-HAND.

height and play of the batsman; but on a fast true wicket the bowler, if he be a fast bowler, should try to pitch the ball about four or five yards from the popping crease, *not less*, for a batsman of about 5 ft. 10 in. in height, the pitch being shorter or longer according as the batsman is tall or short, but to bowl, as some men do, about six or seven yards from the crease is to bowl with the idea of hurting, or at least frightening the batsman, which is contrary to the spirit of the game. If the wicket is slow or sticky, the ball may be pitched at least a yard further up, as the rise is more abrupt. In the case of a slow or medium-pace bowler the ball should be pitched further up than it is by a fast bowler, to prevent the batsman from having time to step back and pull the ball.

Accuracy and length are the essentials of bowling, and till they are acquired break may be left alone, but for the first-class bowler a combination of the three things is absolutely necessary; so it is now assumed that the first two have been fairly perfected, and that the question of break and spin remains.

Break and Spin.—A ball is said to break when, on touching the ground, it deviates sharply from its original line of flight. When it is delivered by a right-hand bowler and twists from the off to the leg, it is said to "break back"; when from leg to off, it "breaks from leg"; but a left-handed bowler's "break-back" twists, for a right-handed batsman, from leg to off. It will be observed also that the ball, delivered round the wicket, may, in its natural line of flight, which is not parallel to the line of the wickets, hit the stumps even if it does not pitch on a line drawn from wicket to wicket. This ball is said to "go with the arm," and a slight amount of leg-break is often combined with it.



[*Photo. by G. W. Beldam.*

A. Fielder. Fast Right-hand.

A ball is said to have "spin" on it when it gains an acceleration of pace, not necessarily a variation of direction, on touching the ground. Such "spin" is generally a natural gift, due to a practically unknown peculiarity of delivery, and there are probably few men who can make any given ball spin at will.

"Break" is occasionally natural, but most frequently acquired, and it is caused by giving rotation to the ball as it leaves the fingers, the break-back being the most easy to acquire. In the following remarks the bowler is supposed to be right-handed. To make the ball break back, it must be made to rotate from left to right, which is in most cases effected by holding the ball with the fore-finger round the seam; at the moment of delivery this finger and the wrist turn outwards, *i.e.*, from left to right, so that the back of the hand is downwards after the ball has been released. Some men put this break on with the middle finger; indeed, every bowler finds out his own best method, but the foregoing description will be a useful preliminary hint.

To make the ball break from leg, it must be held more in the palm of the hand, and the rotation must be from right to left. The third and little fingers produce the rotation, and the hand turns over with the ball, the back of the hand being now uppermost. It may be added that accuracy with the leg-break is very hard to acquire.

It is most important that a bowler should be able to vary his pace, unobserved by the batsman. To do this, the action and run must be the same as before, but the ball should be allowed to drop back from the fingers into the palm, and the shoulder-blade restrained. The result will be a slower ball, but it must be tossed a little higher in the air and pitched rather farther up to complete the deception and induce the batsman to play forward to it and mistime it. This art of variation of pace is not easily acquired, but it is invaluable, especially when the batsman, having made a fine drive, can be induced to try to repeat the stroke on the deceptive slow.

The following are different balls which

the fast bowler should have at his command.

(i.) The good-length ball, already explained.

(ii.) A very fast, short-length ball, just on the off-stump, or just outside it, often tempts the batsman to hit too hard at it, and, mistiming it, to hit a catch to the slips or wicket-keeper. Care should be taken not to bowl such a ball at the batsman's body.

(iii.) The "yorker" is most useful. Its exact pitch varies according to the batsman's height, but it may be said, generally, to pitch between the creases. No man can score off it with any certainty, though to the good batsman it presents no special terrors. Its chief merit is that it may catch him off his guard for the moment, with disastrous results. It is a capital ball to give a batsman when first he comes in, but as it entails special exertion it should only be bowled as a variation, in which its chief merit consists, and not continuously. Two variations of the "yorker" demand a word; cricketers know them as "the curling yorker" and the "running-away ball." Both of these curl in the air before touching the ground, the first from the off, the second from leg. The former occurs more frequently with a cross wind, the second when the wind is directly against the bowler. No bowler, it may be asserted, can bowl either ball at will, though base-ball "pitchers," who "chuck" or throw the ball, have ample command over the curve, while to some bowlers the "curl in the air," however produced, is natural; yet it may be positively stated that no bowler can make any given ball take this peculiar flight. If, however, the bowler, bowling with a cross or head wind, finds that a ball, well pitched up, seems to curve in the air, he should pursue his advantage, as such a ball is most perplexing to the batsman.

(iv.) The "full-toss," or "full-pitch," pitches right on the wicket, and is useful as a variation to keep the batsman on the alert and prevent him from settling down.

When once a batsman is "set," the bowler must try every device in his power, the head aiding the hand; least of all must he lose heart. No wicket is impregnable, and he must storm at the fortress till he brings about a capitulation, remembering for his comfort that many a bad ball gets a wicket. The bowler should at all times see that his fieldsmen are properly placed, and especially, if he be a fast bowler, short-slip and cover-slip; the former about three yards deeper than the wicket-keeper (who is supposed to be standing back), and a yard to his right; cover-slip is about a yard deeper than short-slip and a yard to his right. If a batsman is known to "cut" finely, third man may well field on the boundary, especially if the ground is hard.

To get the full value out of the off-break, the fast bowler especially should bowl over the wicket, but he should train himself to bowl on either side, as a variety; indeed, many fast bowlers always bowl round the wicket to a left-handed batsman. Throughout this paper, it should be noted, the writer has had right-handed men in mind.

[*Photo. by G. W. Beldam.*

J. T. HEARNE. RIGHT-HAND MEDIUM.

The bowling of the present day is largely affected by the perfect wickets now provided, this perfection accounting in the main for the large scoring. They render the bowler's, and especially the fast bowler's, task hard indeed. Mere straightness, in consequence, is almost useless unless the bowler has some variations at his command. On the extraordinarily hard, true wickets which prevail in Australia, the fast bowler cannot be said to be a great success. He has to adapt himself to the changed conditions and bowl a much shorter length, owing to the greater speed with which the ball travels on to the bat, making what would be a good-length ball in England almost a half-volley, or at any rate one that lends itself to be driven. In England it is a hard task to bowl out good batsmen, but in Australia that task becomes herculean.

The paucity of really good bowlers compared with the number of first-class batsmen is a matter for surprise and regret. The reason is not far to seek, and may be found in the fact that much more pleasure is derived from learning to bat than to bowl, and in the case of amateurs the ball is almost neglected. With regard to professionals, the fault lies not so much in the aspirants themselves as in the habit which prevails in many counties of having a "Colts' match" early in the year, when the weather is cold and the young players out of practice. Then, the match being over, and no one, as is natural, having distinguished himself, the "colts'" are relegated to obscurity. The county which looks to the future, which keeps an eye on its recruits, which subsidises them by retaining them as "ground bowlers," and which supports a well-organised "second eleven," will surely reap its reward.

[*Photo. by G. W. Beldam.*

A. E. RELF. RIGHT-HAND MEDIUM.

T. RICHARDSON.

Medium and Slow Bowling.—The medium-paced bowler is a bowler of varied paces, a bowler who, in cricket language, "mixes them"—that is, seldom bowls two consecutive balls of identical pace and length. If, however, he detects a weak spot in the batsman's defence, if he sees that a ball of a particular length and pace puzzles and perplexes him, he should give him that ball at least once an over, following it up with something of an entirely different nature, either much faster or much slower, but the alteration in pace must be concealed, as far as possible, at the moment of delivery. A slower ball may be delivered and its pace concealed by checking the arm at the instant before delivery; a fast ball by swinging the arm further back, the pace of the run and the usual action being kept as far as possible. Needless to say, the variations of pace must not follow a stereotyped sequence of order. It is a good variation to deliver the ball with the arm raised sometimes as high as possible, sometimes almost at a right angle with the body. If the bowler can make the ball break both ways, he would of course use the two breaks at different intervals, and it is well to vary the *amount* as well as the character of the break. To a new batsman the first few balls may well be bowled without any break at all; he may imagine that in the existing condition of the wicket the bowler cannot make the ball break, and an unexpected "break-back" may secure his wicket. A very useful ball, from the slow bowler's point of view, follows two or three break-backs which have pitched, at a good length, a few inches outside the off-stump. It should pitch at about the same length, have no break, and be somewhat faster, so as to conceal the absence of break; if the batsman fails to realise the situation, a catch at the wickets or in the slips is very likely to follow. In

[*Photo. by G. W. Beldam.*

G. H. HIRST. LEFT-HAND MEDIUM.

fact, to lay down a general maxim, it is good to make the batsman think that the bowler is mechanical and to induce him to be mechanical too. This effected, an unexpected motion on the part of the bowling-machine may have a very surprising result on the batting-machine. But the contest is one of brain *versus* brain, as well as of hand *versus* hand, and the better man, for the time being, will win. An important factor in the duel is the temperament of the contestants; there is the steady bowler as well as the steady batsman; the brilliant batsman finds his counterpart in the brilliant bowler. When two of the former type are in opposition, things rule dull for the spectators; when brilliancy meets brilliancy the whole game glows. Indeed, bowlers may be put, generally, into two classes: firstly, those who "pound away" on the principle that, "if you knock at the door long enough, someone is sure to open it"; secondly, those who are not capable of such machine-like regularity, but who make up for the want of it by an occasional flash of inspiration, by a ball that even the best batsman cannot meet. One essential every bowler who has any pretensions to the name must possess—a perfectly equable temper. It is desperately trying to have laid a trap for the batsman, to have lured him on to ruin, and to have led him to make the stroke that should have been fatal, and then to see the ball drop out of the fieldsman's hands; but it is at this moment that the philosopher must prevail over the man. No one is more mortified or more sad when a catch is missed than the erring catcher, but when the bowler adds to his mortification by a hasty exclamation of disgust, that fieldsman is spoilt for the day.

[*Photo. by G. W. Beldam.*

C. BLYTHE. LEFT-HAND SLOW.

[*Photo. by G. W. Beldam.*

E. DENNETT. LEFT-HAND SLOW.

It is often very useful to change ends and to change from one side of the wicket to the other. The former variation is subject to the approval of the captain, but the latter should always be tried when batsmen are well set; consequently, every bowler should accustom himself to bowl on either side of the wicket. Again, when the bowler has a good command of the ball and the break, no device is more successful than to bowl several balls with a fair amount of break, and another with just a little more twist; the ball that gets the wicket is the ball that just gets past the bat and does not just get past the wicket; hence a very little additional break may have the desired effect. If, however, the wicket is "caked" or "crumbled" (*see* p. 460), a change—for a "break-back" bowler—from "over" to "round" the wicket is often useful, as the ball is not so likely to miss both bat and wicket.

One maxim the slow bowler, and indeed the medium bowler, should lay to heart, viz., that a short-length ball seldom bowls a man, but that an over-pitched ball is often fatal, and that a series of half-volleys is more likely to succeed than a series of long-hops.

Above all things, a scrupulously fair delivery should be cultivated, free from all taint of suspicion of "throwing." To define the difference between throwing and bowling is most difficult.

In a "fair" delivery the arm is almost straight and swings with the body; in an unfair delivery it is bent at the elbow, and the elbow, instead of following the swing of the arm, is stopped at the body with a jerk, which stoppage and jerk are, in the writer's opinion, the essential points of a throw. It is right to add that what seems a throw to one man seems perfectly fair to another, and that bowling which seems unfair from one point of view (*e.g.*, from the side or back of the bowler) may seem perfectly fair from another, the batsman, strange to say, having often the worst chance of judging, owing to the "foreshortening" of the arm.

It is most important that the bowler, directly he has delivered the ball, should hurry back to his wicket—always supposing that he is not called upon to field the ball or make a catch—so as to receive the ball when thrown up by the fieldsman, being careful to keep the wicket between the fieldsman and himself. With this in view all bowlers should practise how to "take" the ball and "put the wicket down" quickly and smartly. As the bowler's hands are unprotected, this may imply some hard knocks, and if the bowler knows that the fieldsmen are "backing up," he may, to save his fingers, let a hard throw go by, unless there is a chance of getting a wicket, for which purpose he must take any and every risk of being hurt.

An opportunity of running a man out under Law 35 occurs but seldom, but it may be watched for, and there is nothing unsportsmanlike—as some people hold—in exacting one's strict rights, to say nothing of the fact that the batsman who backs up too soon is taking an advantage of the bowler to which he is not entitled.

Finally, the bowler should not forget that he has ten men to support him, and that there are more ways of getting a batsman out than clean bowling him. A hard hitter may be tempted to hit a half-volley into long-field's hands, or, in trying his favourite drive, to mistime or miss-hit the ball. A man may have a special stroke for a particular ball; it is often useful to tempt him to try this stroke early in his innings, and before he is well set. But as the devices of the bowler are best learned by experience, the beginner will gradually acquire them for himself, but he should early accustom himself to note the style of the opposing batsman and to observe which balls seem to puzzle him, and which balls he plays or hits with ease.

Googly Bowling,—I have been requested to write on what is becoming almost a threadbare topic and one which I approach with much diffidence, inasmuch as I have been out of cricket so much, and have had no opportunity of personally studying the methods of those who are now considered the greatest exponents of the art of the "googly," and can consequently speak only from my own experience, which was obtained some years ago. These intervening years have witnessed great changes, one might almost say a revolution, in the art of bowling, and have given us the spectacle of a visiting team admittedly and decidedly inferior to the best English sides in batting, which was, nevertheless, able, through the skill of its bowlers and the novelty of the methods they employed, to hold its own against an England XI. in this country. What these bowlers are like in their own country and on matting wickets can readily be gleaned from the records of the two last teams to visit South Africa. While one must appreciate and commend the enterprise

[*Photo. by G. W. Beldam.*

MR. B. J. T. BOSANQUET.

of the South African bowlers in so readily grasping the potentialities of this form of bowling, and its peculiar suitability to their matting wickets, at the same time, while one must also admire the great perfection to which they have attained, one must not forget that it is probably the fact that they have these matting wickets to bowl on which has had a good deal to do with the rapid growth and development of the "googly" in South Africa. Bowlers over here have frequently been blamed for their lack of enterprise and for being so slow to discover the efficacy of this type of bowling and to master its difficulties, but there is not the least doubt that it is considerably more easy to bowl what is known as a "finger-break" in a warm climate and on a matting wicket. The latter is, *par excellence,* material for the exercise of the "googly merchant's" craft, as the ball not only gets a good grip on the matting, thus enabling it to break to a surprising extent, but it also takes the break and does its work very quickly, and at the same time gets up to a good height. The nearest approach we get to it is a fast wicket that has slightly "crumbled," or, in other words, of which the surface has been cut up and broken.

MR. D. W. CARR.

Personally, I have had little experience of matting, but have always found it very easy to bowl on, owing to the amount of break one can get on, and the quickness with which the ball leaves the pitch. This applies almost equally to the leg-break and to the googly, though the latter frequently comes quicker from the pitch, owing to the amount of overspin imparted to the ball.

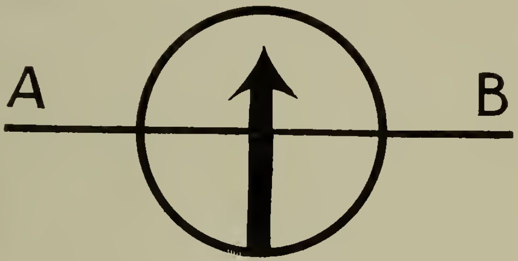


FIG. *a.*

In this connection my attention has been called to an article written by Mr. Vaile, who professes to explain how the googly is bowled. In it he attributes the googly to overspin imparted to the ball at the moment of leaving the hand. Now one would have thought it sufficiently obvious, even to a lay writer, that a ball to which pure overspin (*i.e.*, a rotary motion in a line from the bowler's hand to the wicket, Fig. *a*), has been imparted can only continue in the same line of flight after striking the ground, though with an acceleration of speed. This can be the *only result* of overspin pure and simple, and, unless lateral spin is added, it is impossible for a ball

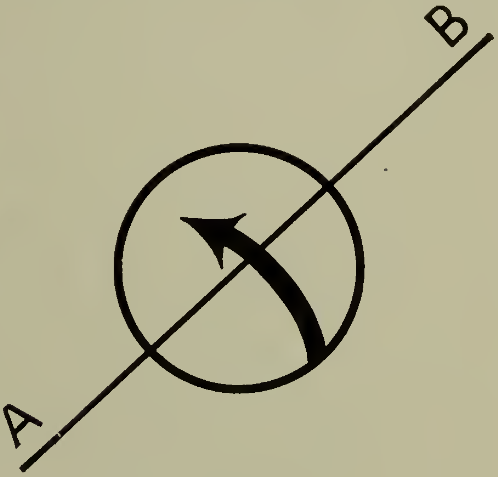


FIG. *b.*

to *break, i.e.,* continue in a different line of flight after pitching, so that we find, so far from the googly being the result of overspin, that where overspin exists it is the result of the googly. Mr. Vaile's article is also illustrated with photographs which, with few exceptions, show the ball rotating on an axis of spin which must infallibly produce a *leg* and not an *off* break, which is all that a googly is. The whole point of the dropping of the wrist is quite lost sight of, or not appreciated, and in order to correct the false impressions which may be gleaned from this article, I will endeavour to explain clearly how the googly *is* bowled. Everybody knows more or less what an ordinary leg-break is to a right-handed batsman, and how it is obtained by a right-handed bowler. It is almost without exception what is known as a "finger-break," *i.e.*, is obtained by movements of the fingers which impart spin to the ball, and not by any peculiarity of action, these movements vary with every bowler, but the result is the same with *every over-arm* bowler, viz., the ball leaves the hand rotating from right to left, so (Fig. *b*). This applies both to right- and left-handed bowlers, and the result in either case is as shown, though the angle of inclination of the axis of spin varies. This result, as you can see, consists of a mixture of overspin with lateral spin from *right to left*. The ordinary off-break is simply the opposite, viz., overspin with lateral spin from *left to right*, so (Fig. *c*). Now the googly is simply a normal off-break obtained by abnormal means, *i.e.*, that dropping of the wrist at the moment of delivery to which I have referred above. This is the keynote of the whole matter, and, once it is understood, the whole mystery stands forth plain for all to comprehend. Follow me a little further. We have a ball about to be delivered rotating as in Fig. *b*, with the axis of the spin thus: /; now, if the axis of spin just at the moment of delivery were changed to \\, as in Fig. *c*, what would be the result? The ball, instead of leaving the hand spinning over from right to left, would spin from left to right, and would break after pitching in the line of spin, *i.e.*, from left to right, in other words, an ordinary *leg-break* in embryo has become an "off-break." How has this been done? Simply by *dropping the wrist* at the last moment so as to *change the axis of spin*, and to cause the ball to leave over the *back of the hand*. There you have the whole story of the "googly." This is the secret of its composition and the method of its delivery, and perhaps when you realise that it is merely an ordinary leg-break metamorphosed into an ordinary off-break at the last moment, you will not be so much afraid of it. The dropping of the wrist is the "sign of the googly," and is the only indication by which the batsman can tell that it is coming, though it is possible at times to notice the direction in which the ball is spinning during its passage through the air; but this is generally only possible with a very slow ball. However, it is a point worth remembering, and I have met several batsmen who found it of great assistance to them when they were unable to spot the break as the ball left my hand. There are one or two points of

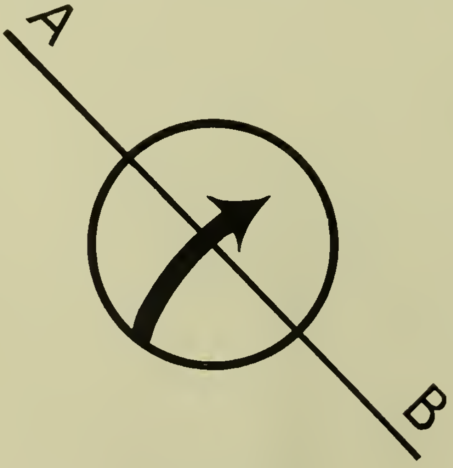


Fig. *c*.

[*Photo. by G. W. Beldam.*

Mr. W. W. Armstrong. Leg-Break.

general interest which have struck me from time to time.

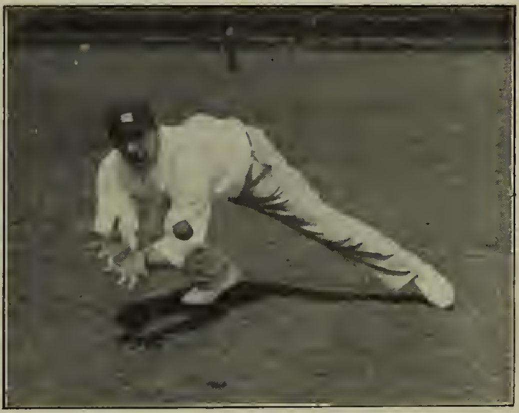
One is the curious difference in batsmen and their methods, and the quickness with which they learnt to distinguish the googly. One or two spotted it the first time I bowled to them, and never experienced any difficulty in playing it, while others could never detect the difference in the delivery, and never would. I have bowled to certain people in the nets time after time, and they have never been sure of the break, while others readily detected it after a few innings. Of those who were unable to detect the break, the most successful were those who made a practice of hitting every good-length ball of which they had any doubt round to leg, and this is the method I should recommend to all who find trouble in playing this type of bowling.

It is a remarkable fact that the googly has been bowled for years past, and by many bowlers, but only accidentally, and without any knowledge of how or why the break came. It is surprising that none of these bowlers ever investigated this phenomenon, or tried to develop their powers in this direction. As an instance of this, I once saw Mr. P. W. Cobbold, bowling on a sandy ground, dig so deep a hole with his left foot as to cause him to overbalance as he delivered each ball. The effect was remarkable, inasmuch as he found himself bowling nothing but "googlies," and absolutely unable to bowl an ordinary leg-break. On going round the wicket, he once more became a leg-break bowler, and could not bowl a single googly! Further, I have never seen him consciously bowl a real googly before or since. This is a very good illustration of the manner in which the googly is obtained, and may help to make clear the effect of the turning over of the hand and wrist on which I have laid such emphasis. This is the point which escaped notice for so long, and I believe I can claim to have been the first to discover the principle, and to apply it *consciously* in practice. Once understood, it is absolutely simple and within the reach of everybody, and one hopes to see even greater developments along these lines than the South African bowlers have shown us. It is merely a matter of practice, and, given sufficient application, the knack can be acquired by anyone.

B. J. T. BOSANQUET.

Fielding.—It is not given to every man to be a brilliant fieldsman, but as good fielding, both catching and "ground-fielding," is essential to anyone who has even second-class pretensions, it should be carefully practised; there is no better practice than for four or five men to go out and to take it in turns to hit the ball either in the air or along the ground to each other. It is well to take out several balls, and to vary the distance between striker and fieldsman. It will soon be found that nerve and courage are necessary as well as agility and alacrity, and that the art of catching can be largely improved by practice. Nerve, activity, and accuracy are therefore essential—nerve for facing a hard hit, activity for getting to the proper place to stop it, and accuracy for returning it hard and straight to the bowler or wicket-keeper.

Catching.—This should be practised at all distances from the striker, in every possible position relative to him, with both hands together, and with right and left separately. The fieldsman should carefully watch the batsman, as his motions generally give a clue to the direction of the hit; but short-slip and cover-slip should watch the bowler, as the ball when it comes to those places is seldom sent there intentionally, and the batsman's movements give no hint. No rules can be given for sharp, low hits to fieldsmen standing from seven to thirty yards from the wicket; each man will find out by observation and practice what method is easiest for himself, but a one-handed catch may well be received on the middle joint of the middle finger, when the other fingers will form a sort of cage to retain the ball; other men prefer to take it on the lowest joint. Again, it is sometimes useful with a hard-hit catch, far from the body, to try to break its force by knocking it up a little way into the air, but there is a distinct risk attaching to this process, unless practice has made the fieldsman an adept at it, and the catching of hard hits.

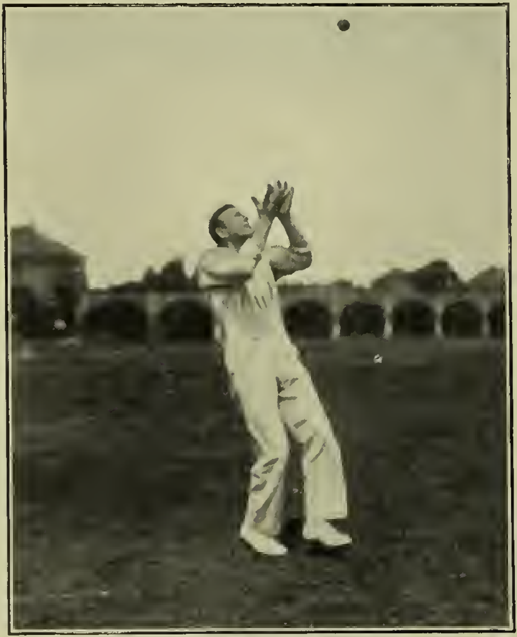


[*Photo. by G. W. Beldam.*

FIG. 14.—A. E. TROTT IN THE SLIPS.

which come to the hands like a flash of lightning, is more a matter of instinct than of instruction. Fig. 14 is a good illustration of a sharp, low catch as it comes to point or slip. In all catches it should be remembered that the ball should be allowed to strike the hand, which should then give with it slightly so as to break the force of its impact. Any "grabbing" at the ball is almost invariably fatal and is likely to knock the ball away. Long fingers and a lissom wrist are a great adjunct to good catching.

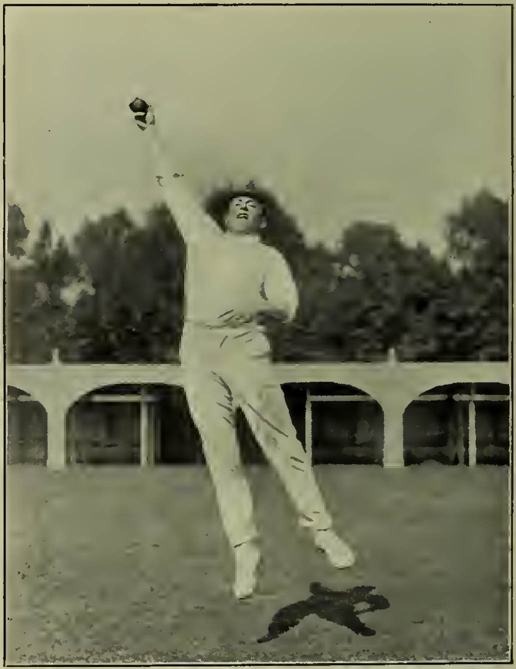
If the ball is hit high, the first thing is to judge the true course of its flight and the place of its descent, as naturally it seldom singles out the fieldsman. This "judging" must be instinctive and instantaneous, and must be followed by a rapid run to the place of descent, the fieldsman, if possible, getting to the place and steadying himself for the catch, which, if all goes satisfactorily, will be effected as in Fig. 15. The sides of the hands are close together, thumbs uppermost, forming a sort of cup, and the wrists held close to the body so that the ball may be "hugged" (Law 22) if it jumps out of the "cup." The wrists should be allowed to give a little as soon as the ball is felt. Fig. 16 shows a one-handed catch in the long-field.



[*Photo. by G. W. Beldam.*

FIG. 15.- MR. A. O. JONES.

All these preliminaries are only occasionally possible, so the cricketer must accustom himself to rushing at catches at all sorts of distances from him and on all sides of him, holding them as best he can; and if there is any one maxim which should be writ large in his mind it is "Try for every ball hit towards you, whether in the air or along the ground." Many a wonderful catch has been made which the fieldsman never thought he could even reach, still less hold, but which he tried to reach and catch. Occasionally a few runs may thus be lost, but the chance of a wicket is worth a risk in runs, and even if the catch does not come off the fieldsman will have won the bowler's heart. When a catch is missed—as many catches are—the next thing to do is not to tear one's hair, but to throw the ball in; a man is occasionally run out by a sharp return from a missed catch; anyhow, the "hair-tearing" can wait. One more hint, "Never use one hand for a catch when both can *easily* be got to the right place"; but if a catch is nearly at arm's length from the body, it is sometimes easier to take it with one hand than with two. Experience is the only guide.



[*Photo. by G. W. Beldam.*

FIG. 16.—MR. W. W. ARMSTRONG MAKING A ONE-HANDED CATCH IN THE COUNTRY.

Ground-Fielding.—If a ball is hit along the ground, the first thing to be done is to stop it; but mere "stopping" is not sufficient; it should be stopped, and held, and thrown in without an instant's delay to bowler or wicket-keeper. The hand is the proper member to stop the ball with, but as the hand may be deceived, a second line of defence should be provided, viz., the legs. Hence, when possible, the fieldsman should stand full face towards the line of the ball, heels together—this is most important—and hands together in front of the heels. In short, the ball must be stopped at all hazards. But mere stopping is not always enough. If the ball is only moving towards the fieldsman at a moderate speed, and he remains stationary, it is clear that the batsman may have time to get a run, to avert which the fieldsman must not await, but meet the ball, dashing in at full speed, picking it up clean, and throwing it in. One attempt will convince the novice of the difficulty of doing all this when the ball is moving slowly. Augment the pace, and every difficulty is many times multiplied. The moral is "Practise!" The beginner should, however, be warned against trying to be brilliant when, on the face of it, he can save the run without dashing in, as brilliant fieldsmen often lose runs by dashing at the ball and missing it, when "running" was the last thought in the batsmen's minds.

[*Photo. by G. W. Beldam.*

A. E. Trott making a One-handed Catch in the Slips.

Throwing.—Too high a value cannot be set on hard and accurate throwing, in which point many English fieldsmen, perhaps owing to the effect of a wet and chilly climate on the necessary muscles, are often deficient. The ideal throw comes into the wicket-keeper's or bowler's hands about six inches above the wicket; from a distance of thirty yards or less it should go straight from hand to hand; from longer distances it should be thrown on to the ground, but so as to be a *long-hop* to the receiver; any other "length" is very difficult to handle. From long distances it is a waste of strength to throw a ball high—a low, skimming throw is far more useful, and reaches the wicket quicker. The ball should be thrown, too, directly it is fairly in the hand, as a long preliminary "wind-up" is wasted time; the batsman, unable at once to judge the accuracy of the throw, dare not start when it is seen to be on its way. It is very useful to be able to hit the wicket, but only rarely should the experiment be tried. If the wicket-keeper knows his business, the time wasted in catching the ball and breaking the wicket is infinitesimal; if, however, time is very precious, the fieldsman may throw at the *top*, and the top only, of the stumps. Especial care should be taken to spare the bowler's fingers as much as possible.

A cricketer should be able to take any place in the field to which the captain may ask him to go, but after some experience he will probably find that some particular position suits him best, and to that place he should go whenever he has the opportunity. In case either bowler or wicket-keeper should miss the ball, or the ball go wide of him, at least two fieldsmen should be behind him to save "overthrows"; nothing shows want of organisation so much as bad "backing up"—a term, by the way, which is also used when a fieldsman passes

[*Photo. by G. W. Beldam.*

J. T. Tunnicliffe.

the ball on from a throw from the deep-field which is too long for the original fieldsman's powers.

No special directions seem needed for special places in the field; some men will find that their quickness qualifies them for positions near the wicket, others that their powers of throwing and of judging long hits makes them good out-fielders, but for short-slip and cover-slip a few hints may be useful, as, especially to fast bowling, they are the most important men on the side, not excepting the wicket-keeper. From these two, then, especial vigilance is demanded; they must watch the ball—not the batsman, as other fielders should—from the moment the bowler begins to run, stooping down, hands to the front ready for action, in the crouching position of the wicket-keeper. Quickness of hand is more important to them than quickness of foot, and they should be able to catch well with either hand. No place in the field is more delightful or more difficult.

[*Photo. by G. W. Beldam.*

Mr. A. O. Jones.

The Wicket-Keeper.—No post, except the bowler's, is more important and more responsible than the wicket-keeper's, and by the end of the season he will generally have dismissed more of his opponents than any other two fieldsmen, with the possible exception of short-slip. To a keen and competent cricketer the charms of the position are many; the wicket-keeper is incessantly on the alert, he enjoys the finest view of the game, he can appreciate better than any one else the delicacies of the bowler's and batsman's art, and he can tell, as no one else can, whether the fieldsmen are in their right places. Hence it is the ideal place for the captain, and even if the two offices cannot be combined, the wise captain will generally consult his wicket-keeper as to any changes of bowling and the progress of the game generally. A wicket-keeper must be prepared to take some painful knocks; balls are hard and hands are soft. It is most difficult to judge the exact course of the ball, especially if it be deflected; a blow on the shin, rib, knee, or top of the thumb is both painful and disconcerting; batsmen do not always get out of the way of a rising ball in time to let the wicket-keeper do the same, and fieldsmen often throw the ball in most erratically. Still, as every team must have a wicket-keeper, and no cricketer must shirk a few hard knocks, every aspirant should try whether he possesses the needful quickness and accuracy of hand and eye.

[*Photo. by G. W. Beldam.*

Mr. A. O. Jones.

The wicket-keeper's first duty is to get the batsman out, his second—subsidiary to the first, but quite important—to save runs in the shape of byes. Except when the bowling is remarkably fast, the skilful wicket-keeper may attain both ends by standing close up to the stumps, but to very fast bowling it is generally considered advisable to stand about ten yards behind the wicket, sacrificing the chance—which seldom occurs with really fast bowling—of stumping a man. When standing up, he should be so close to the wicket that he can easily touch it with his hands; his body should be mainly on the off-side, where most of the chances come, but his left leg should be just outside the leg stump, so as to stop any ball which may just miss it. If the ball is seen to be coming outside the batsman's legs, he must jump across like lightning, knees together, and hands at the height at which the ball may be estimated to come, as the batsman's body prevents a consecutive view of it. Some wicket-keepers stand entirely on the off-side, when they can implicitly trust the bowler's accuracy. The body must be bent—the wicket-keeper must stoop to conquer—till the eyes are a little higher than the wicket. The hands should be spread out, with the palms forward and well pressed back, so that the finger tips may be spared injury as far as possible. When the batsman plays forward there is always a chance that he will lift his right toe, if only for an instant, hence the wicket-keeper, so as to lose no time, must take the ball directly it passes the wicket and bring it like lightning up to the bails, or the precious moment may be lost. The bails should not be knocked off unnecessarily, but it is better to do so too often than too seldom. If the batsman touches the ball and also leaves his ground, the wicket-keeper must not neglect to break the wicket even though he has caught the ball, as the umpire may fail to hear or see the catch, and in that case "the second string to the bow" is invaluable. There is no chance of a "stump-out" if the batsman plays back [*see* BACK-PLAY, p. 452], hence the wicket-keeper will then be wise to take the ball well behind the wicket, which will give him a better chance of following its course and of saving his hands. He must learn to stand perfectly firm, never flinching except when a ball rises suddenly. When learning, a long-stop gives confidence, but he should be gradually dispensed with; leg-balls may be left severely alone by the beginner. If the hands get badly bruised, they should be rested at once, and above all things, after a long innings, they should be rubbed, while still warm, with embrocation, which will prevent any bruises or soreness from becoming permanent. Appeals to the umpire should be made as seldom as possible, but then quickly and confidently, and only when the wicket-keeper is sure, or nearly sure, of the answer "Out!" The left hand should be well practised in catching and "grabbing" at balls, for which purpose Fives is an admirable exercise. When the ball is thrown in from the field the wicket-keeper should always stand so that the wicket is between him and the thrower, and the ball, as in stumping, should be taken, unless it is coming very slowly, *after* it has passed the wicket. Chances come so thickly to the wicket-keeper that the best men miss many, hence occasional failure must not produce discouragement, for coolness in spite of mistakes often enables a man to retrieve his blunders. If two men are running for a catch, the wicket-keeper should call out loudly, distinctly, and promptly, the name—nothing more—of the man who has, in his opinion, the best chance of securing it. Most wicket-keepers nowadays make their gloves sticky by artificial means, the better to retain the ball, to such an extent that a man has been seen to lift a ball off the ground without grasping it. Whether this is right or not, from a moral point of view, is a moot question, but it is generally done and no objections are raised. If, however, the gloves are *too* sticky, the bowler will complain when he finds that the ball will not readily leave his hand. The practice is useful to wicket-keeping, but does not conduce to good bowling.

[*Photo. by G. W. Beldam.*

A. A. LILLEY.

Too much stress cannot be laid on the necessity of taking care of the hands. No man who has to keep wicket in first-class cricket should risk his fingers by taking the same place in other matches. India-rubber fingerstalls worn inside the gloves are a great protection, both from bruise and dislocation, but some men hold that they interfere too much with the freedom of the fingers' action. Good pads are essential, but, if a bad bruise occurs on the leg, a batting-glove, inside the pad, is a very useful protection; and another useful guard is to have a thick piece of padding sewn on to the inside of the pad, so as to protect the inside of the right knee—a most vulnerable point. Yet one more hint: if the ball is so badly thrown up—as it often will be—that it will reach the wicket-keeper on the "half-volley," he will find it almost impossible, or certainly very difficult, to handle it; as a last resort, he should let it hit his legs (knees and heels together), and so place himself that it may bound from his pads to the wicket. Finally, the wicket-keeper should always return the ball to the bowler as a gentle catch or long-hop; the bowler is bearing the burden and heat of the day, and it is sheer cruelty and bad policy to increase his labours by a crooked return, or a half-volley.

[*Photo by G. W. Beldam.*

A. A. Lilley.

If the wicket-keeper or bowler has to run after the ball, the nearest fieldsman should at once hurry to the deserted wicket, in case there may be a chance of running a man out.

M. C. Kemp.

The Captain.—As the captain who is chosen to manage a side in the field has, almost invariably, a voice in its selection, the two questions—management and selection—are here included under the same head.

The two best bowlers available should be chosen first, as attack is more important than defence. Next comes the best wicket-keeper who can be secured, and after them the three or four best batsmen—always supposing that they are good "fields"; for it must not be forgotten that a fine field always saves runs, though a fine batsman frequently fails to get them. This leaves five places to be filled up; two, at least, must be *good* class bowlers, who can also bat fairly well, and the last three vacancies may be given to men who can bat well and field well, regardless of their bowling powers; though probably one at least can "go on" at a pinch. When there is any doubt, a sure fieldsman who can bat fairly well should be selected over the head of a better batsman who is known to field badly, but it is no good sacrificing batting to moderate bowling. "If you can't win with four good bowlers, you can't win at all," is a recognised axiom, though if the players can bowl as well as bat and field, so much the better. A "googly" or a lob-bowler is a useful addition to a side. So much for the composition of the team, which contains two bowlers, selected for their bowling only, and a wicket-keeper chosen merely to fill that post; two men who bat fairly and bowl fairly, the rest being all respectable fieldsmen, and some of them brilliant batsmen—with, perhaps, a change bowler or two among them. With a side so composed, the captain need not be afraid "to speak with his enemies in the gate."

Some remarks on the captain's duties preliminary to the call of "Play!" will be found on p. 447; but if he wins the toss, he has first to make up his mind whether he will send in his own side or his adversaries. The latter policy is rarely good. To take first innings implies that the ingoing side has the wicket when fresh, and that the other will have to play the fourth innings when the turf will be more or less cut up—a serious disadvantage. To send the other side to the wickets implies that the captain is sure—nothing short of "sure"—that the ground will improve with time, and during the continuance of the game. The man who can feel thus positive as to his weather-wisdom has not yet been born; hence the best advice, notwithstanding what others may say, is, "Go in nearly *always*, if you are lucky to win the toss." Critics may be wise after the event, but that means nothing. Very special circumstances may alter cases, but there are few occasions when it can possibly be a foreseen disadvantage to bat first. One may be a two- or three-day match with every prospect of settled weather, the wicket "caked," but rapidly on the mend under a mid-summer sun in a cloudless sky.

In making out the "order of going in," the best batsmen should be sent in early, but a young player, a "colt," who is being played as a batsman, may well be sent in first, before the bowlers have got into their swing, as a good beginning will banish all nervousness. If two men are of equal merit, the one who can bowl should go in before the other, so as to give him a chance of a rest if he makes a long innings. The last few men, the "tail," may bat in a descending order of merit. The captain should always be on the spot, in case any point of strategy requires his presence, especially if his side goes in late in the day, and a wicket falls just before time, in which case it may be advisable to send in an inferior batsman in the waning light, so as to avoid, if possible, the loss of a more valuable wicket. But on this point experience—and all captains should be experienced—is the best guide. A left-hander may well be sent in early, as he is likely to destroy the equanimity of the field if he makes a long stay. Slow scorers, again, may be sent in before hard-hitters, if time is of no importance, but if the "game has to be forced," the hitters must have precedence, especially if rain has fallen on a hard wicket, and is followed by bright sunshine. Such a condition of things always implies a "caked" wicket in the early future, and the hitters must make their runs while the sun shines, but before it has ruined the wicket. If time is precious, a left-hander should not be sent in, as the incessant changes in the field waste time. The captain should see that a heavy roller is not used after rain, if its weight is likely to bring the water to the surface.

The captain's task is more arduous, and more severely criticised, when his side is fielding. He must of course assign to his men the positions which are known to suit them best, though these may be varied as the game proceeds. He should be careful to see that no man has an unnecessarily long journey between the overs, and that his bowlers are not required to run about in the field after their spell of bowling. A bowler must be spared all unnecessary exertion. All changes in the position of the fieldsmen should be made by the captain, but only after consultation with the bowler, or at his suggestion, if approved; but the captain of an eleven should be, like the captain of a man-of-war, an absolute autocrat. At the same time, he should so far veil his despotism as to consult with the bowler occasionally, and with the wicket-keeper always—or nearly always—as to any change of bowling which events have not rendered obvious. He must watch the score, and remember that it is generally better policy to change his bowling too often than too seldom, and that when one of the original, and presumably best bowlers has been removed, it is better to reinstate him as soon as possible, than to try another bowler, who is inferior. If the principle may be worked into a maxim, that maxim would run, "Trust to your best bowlers to get the wickets, and regard the others as mere reliefs"; at the same time, the willing horse must not be worked to death, and frequent but short rests will help the captain to make the most of his attack.

When two batsmen are well set, the captain's power of resource is tested to its uttermost; if a separation seems hopeless, he should try every bowler, however inferior, in turn, hoping that a stroke of luck may break up the partnership. This done, the best bowlers should be called to the attack once more, as if the inferior, though successful, bowler is allowed to continue, the newcomer will probably "get his eye in," and defy the most dangerous assault. A bowler sometimes sends down a succession of "maidens." Unless the batsman's defence is seriously taxed, this bowler should be changed; he is only helping the batsman to get set; but on this point the wicket-keeper should always be consulted, as he can see better than anyone else if the batsman is really at his ease or not.

[*Photo by G. W. Beldam.*

MR. G. L. JESSOP.

The captain should field near the wicket—if he can keep wicket, so much the better for his side—and he must set his men an example of hard work and cool temper; for the captain who shows signs of ill-humour, however slight, at any blunder on the part of his men, will never pull them together in the hour of distress. A word of sympathy with the man who has just missed a catch will restore the erring one's peace of mind, which a hasty ejaculation would have banished for the rest of the innings. To be a disciplinarian is one thing, to be a martinet is another; and this the captain need seldom be.

It would be easy to write for ever on the various qualifications required in a captain, and the various contingencies which may call for special qualities. The hints here given must be sufficient, with the *addendum* that only a cricketer of some experience should accept the post, unless it is forced upon him, and that only experience in the field and observation from the pavilion can teach him his multifarious duties.

The Umpires.—The ideal umpire must be a man of wide experience, quick of eye, and prompt in decision. Needless to say, he must know the laws of the game thoroughly. The best umpires are generally first-class professionals, who have recently retired from active service and are known to be men of the highest integrity, with their sight and other faculties still unimpaired.

Umpires have no light task: they are the first to enter the field and the last to leave it; their attention is strained throughout to the uttermost; they get practically no rest, as probably one-half of the players do, except the intervals for luncheon, tea, or between the innings; and the points on which an instantaneous decision is necessary are sometimes most delicate, and a moment's inattention, resulting in a wrong decision, may have a very serious effect on the match. Nothing, then, is so wrong—to the writer's way of thinking, so suicidal—as an incessant series of appeals, or, worse still, an expression of ill-temper, when batsman or fieldsman is dissatisfied with the decision of a hard-worked official, who is presumably doing his very best to be impartial and accurate. Only those who have filled the post, however unimportant the match, can fully sympathise with its difficulties.

For the umpires' duties Laws 43—54 should be studied, and the " Instructions to Umpires," issued by the M.C.C. That body appoints the umpires for each match in the County Championship, the list, of some twenty, being revised each December by the captains of the first-class counties. An umpire is not allowed to officiate in a match in which a county for which he has played takes part.

Five minutes before play begins the umpires go out to the wickets, taking the ball and bails with them, but, under the new order, they are required to report themselves to the manager of the ground each day half an hour before the time for starting play. Their positions are shown on p. 448; their first duty will be to give the batsman " guard " (*see* p. 448), standing for the purpose wherever the latter wishes. As the bowler delivers the ball, the umpire at that end must stand so that he can see clearly down the line of the wickets, and watch the bowler's foot and hand (as best he can), in case he delivers a " no-ball." All doubtful catches will be referred to him; if he is unable to give a decision he must appeal to his colleague; if neither can decide, " the existing state of things continues," *i.e.*, the striker remains at the wicket. If the umpire is not *perfectly sure* that the batsman is out, he must give the verdict in his favour. He will be most frequently appealed to for a catch by the wicket-keeper, often the slightest touch on the edge of the bat, and in this case most good umpires agree that the eye must be convinced as well as the ear, for there are many things which may cause a "click" which *sounds* like the contact of bat and ball.

All cases of " leg-before," the hardest of all, come before the bowler's umpire, who must be absolutely convinced that Law 24 has been infringed before ordering the batsman out. It should be remembered that if the ball hit the leg first and the bat afterwards, the striker is out, provided that the ball has fulfilled the conditions required by Law 24. In deciding the question of " the fitness of the ground " (Law 43), the turf should be in a condition fair both to batsman and bowler, and the best umpires consider the ground fit for play after rain if the pressure of the foot brings no water to the surface of the wicket, and if the bowlers can get a reasonable footing. The fieldsman, too, must be able to move pretty freely.

The umpire at the striker's end has practically to decide only on a " stump-out," " run-out " at his end, or " hit wicket "; but as his colleague may appeal to him at any moment, he must never relax his vigilance, and he may no-ball a bowler of whose action he is doubtful.

Umpires have a code of signals by which they communicate with the scorers. Thus, a bye is signalled by holding up the hand; a leg-bye by lifting and touching the leg; a boundary-hit by waving one arm horizontally; a no-ball by extending one arm horizontally; and a wide by extending both. A short run, being loudly called, requires no signal. The scorer answers and acknowledges signals by holding up his hand.

At every cessation of play the umpires should bring the bails away with them; at the end of the match, or of the day's play, they bring the stumps also; hence "to draw the stumps" means "to stop play for the day."

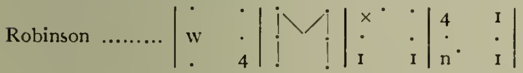
They should be careful to call wides and no-balls clearly and promptly; when a wide is signalled only the non-striker does not know whether it is a wide or not, and may consequently be at a loss whether to run a bye or not.

The Scorers.—Each side usually provides its own scorer, and the two can thus keep a mutual check on each other. Strict attention to the game and to the umpire's signals, which should be promptly answered, is necessary, and care must be taken, when the full score is not shown on the telegraph, that each successive "ten" is promptly exhibited. The method of keeping the "analysis of the bowling" is perfectly simple, and a properly-printed score-sheet really explains itself. An imaginary extract is, however, given here, as a matter of completeness. When only one run is required to finish the game, the scorers are required by tradition to stand up.

Match played at..........*on*..........
between .... *and* ....
............*innings.*

Batsman's name.	Runs as scored.	How out.	Bowler's name.	Total.
Jones...	1 1 3 2 4 1 1 4 ...	bowled	Robinson...	17
Smith ..	....	c Thompson	Robinson...	0
Brown..	4 1 4 4 2 3 1 1 1 4	c and b	Johnson ...	25
Stokes..	1 3	run out	....	4
Noakes.	1 3 4 4 1	st Thompson	Johnson ...	13
Styles ..	1 3 3 2 4 1 1 1 4	not out	... .	20
	Byes, 1 4 4 ; leg-byes, 1 2 1 1 3 ; no-balls, 1 ; wides, 1			19
	Total			

An extract from the bowling analysis might read as follows:—



In the first over a wicket (w) was secured by the third ball, while the last was hit for four runs. The second was a "maiden,' i.e., no runs were scored by the batsman off it. The first ball of the third was wide (×), and the fourth of the fourth a no-ball (n). Only runs from the bat spoil a "maiden," none that are called or signalled, except boundary-hits. The bowler is credited with the wickets of all men whom he bowls out, and of all who are caught, stumped, l.b.w., or "hit-wicket" off his bowling. If a batsman hits the ball on to his wicket, or it glances on to it off his leg, he is registered as "bowled," and the bowler gets the credit of the wicket.

County Cricket.—From very early times, matches between rival counties were common, and attracted much attention and interest, and when in later years it became customary for certain counties, presumably the best, to put a regularly organised team in the field, and to play home-and-home matches with others, it also became customary at the end of the year to analyse results, and to pronounce this county or that the champion county of the year. But as there was an absolute lack of system, it was practically the sporting newspapers which decided the championship, each more or less according to its taste, and no real importance was attached to the title. In 1873 the question of county qualification was raised and settled, and in 1888 a further rule was passed, but no definite "County Classification" was adopted until the middle nineties, when, by tacit consent, certain counties were held to be "first-class," and to be the competitors for the championship, which is now awarded by the M.C.C. At that date, too, several new counties were admitted to the "sacred pale" of first-class, followed by Worcestershire, and later by Northamptonshire. In 1896 a new system of awarding the Championship was arranged with a saving clause whereby it was left to the Marylebone Club to decide the destination of the title and the number of inter-county matches which each county must play, if it wished to qualify for the championship. The whole system may be regarded as "rough and ready," but there is a general "roughness and readiness" about many of the regulations attached to the game which is possibly one of its charms, for, as all cricketers know, a thousand and one problems may be suggested for which the laws do not properly provide, or as to which the dispensers of those laws—the umpires—are not in accord. The trial of a new system, which has, however, serious faults, was arranged for 1910, and in this the order depends on the proportion of victories to matches played.

In a work of this description it would be impossible to follow in detail the performances of different counties and their "ups and downs." A chart of the last fifty years would be full of interest, were it not for the desultory nature of the engagements before the whole question was formally taken in hand.

The following list of counties, which have been held to be "champions" in different seasons, can hardly be regarded (in the absence of definite rules, as was for some time the case) as final, but for the last twenty years it may be considered absolutely correct, and to be founded, for earlier years, on the consensus of public opinion, as the methods of calculation have often differed, and the number of matches played by each county depended on its own sweet will.

COUNTY CHAMPIONS SINCE 1880.

1880. Notts.
1881. Lancashire.
1882. Lancashire and Notts, equal.
1883. Notts.
1884. „
1885. „
1886. „
1887. Surrey.
1888. „
1889. Surrey, Notts, and Lancashire, equal.
1890. Surrey.
1891. „
1892. „
1893. Yorkshire.
1894. Surrey.
1895. „
1896. Yorkshire.

DATES OF FORMATION OF COUNTY CLUBS.

Derbyshire . .	1870
Essex, 1864-5 (dissolved in 1866); re-formed in 1876 and 1886	
Gloucestershire .	1871
Hampshire . .	1863
Kent, 1859 (re-formed 1870)	
Lancashire . .	1864
Leicestershire . .	1873
Middlesex . . .	1864
Northamptonshire about 1843 (re-formed 1878)	
Notts	1854
Somerset . . .	1886
Surrey	1845
Sussex, 1836 (re-formed 1839 and 1857)	
Warwickshire, 1863-4 (re-formed 1882)	
Worcestershire .	1865
Yorkshire . . .	1861

KENT, CHAMPIONS SUCCESSIVELY IN 1909 AND 1910.

E. Fairservice. C. Blythe. F. E. Woolley. W. Hearne (scorer). A. Fielder. Jas. Seymour.
Mr. C. V. L. Hooman. Mr. D. W. Carr. Mr. J. R. Mason. Mr. K. L. Hutchings. E. Huish.
Mr. F. H. Knott. E. Humphreys.

1897. Lancashire.
1898. Yorkshire.
1899. Surrey.
1900. Yorkshire.
1901. „
1902. „
1903. Middlesex.
1904. Lancashire.
1905. Yorkshire.
1906. Kent.
1907. Notts.
1908. Yorkshire.
1909. Kent.
1910. Kent.

SECOND DIVISION CHAMPIONS SINCE 1901.*

1901. Durham.
1902. Wiltshire.
1903. Northamptonshire.
1904. „
1905. Norfolk.
1906. Staffordshire.
1907. Lancashire (2nd).
1908. Staffordshire.
1909. Wiltshire
1910. Norfolk.

"Lord's" and the "M.C.C."—Thomas Lord, born at Thirsk in 1757, was a cricketer of some note in his time. He suggested to Lord Winchilsea and other influential supporters of cricket the desirability of establishing a club in St. Marylebone, and he must have been well supported, for he was enabled to purchase the site since called Dorset Square. The ground was called "Lord's," and the club The Marylebone Cricket Club. Things went on smoothly there till 1811, when the increased rent demanded by the landlord compelled Lord to find a fresh ground. He then removed his turf to a field in the neighbourhood of North Bank, St. John's

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* When first officially recognised.

Wood, but two years later the Regent's Canal was cut through this ground, and Lord again removed his turf, to the present site of "Lord's" in St. John's Wood Road. What arrangement he made with his patrons will never be known, because all the Club records and documents were destroyed by fire in 1825, but he probably purchased the freehold from the Eyre Estate, took all the subscriptions and gate-money, and paid the expenses of the staff and of what few matches were played.

The first recorded match played by the Marylebone Club took place in 1788, the club having been founded the previous year. As has been stated, Lord removed from Dorset Square to North Bank in 1811, but only one match is recorded as having been played there in that year, two only in 1812, three in 1813, the match on July 21st of that year being probably the last played at North Bank. The first recorded match played on the present ground is believed to have taken place on June 22nd, 1814, and Hertfordshire had the honour of opposing the Club on that occasion. About this time Lord built himself a house in the south-east corner of the ground, and lived there until about 1830. In or about the year 1825 there was great danger of the ground falling into the hands of the builders, but Mr. William Ward stepped into the gap and purchased the remainder of Lord's interest. To show the peril of the situation, however, it may be stated that plans were actually drawn and approved for the erection of a series of semi-detached villas along the St. John's Wood Road frontage, and also on the east side of the ground.

Allusion has been made to the disastrous fire which destroyed the pavilion and its contents on the early morning of Friday, July 29th, 1825. The following account of the fire, as it was reported in the *John Bull* newspaper of Sunday, July 31st, 1825, will be of interest. "About one o'clock on Friday morning a fire broke out in the pavilion in Lord's Cricket Ground, and, from its being built of wood, it burnt with such fury that the whole was reduced to a heap of ruins before it was possible for the fire-engines to render any assistance. The pavilion was built at a great expense, lately enlarged and decorated for the accommodation of the various clubs who frequent this ground; and with the exception of the foundation, nothing now remains. There was in the pavilion a large and valuable stock of wine, the property of the subscribers, which along with all their cricketing apparatus now no longer exists. Mr. Neale, the landlord of the tavern adjoining the ground, cannot account for the accident, for there never was any fire in the pavilion during the season beyond a lighted candle to enable gentlemen to smoke their cigars. Such, however, was the strength and power of the fire at its height that some of the trees in the adjoining gardens have been damaged." As has been stated, the fire broke out in the early hours of Friday morning; the match between Winchester and Harrow was completed on the Thursday night, and that between Eton and Harrow took place on the Friday and Saturday, but no mention is made in any of the records as to the inconvenience which the Harrow boys must have experienced through the loss of their cricket paraphernalia. The committee seems to have lost no time in erecting a new pavilion, for the anniversary dinner was held there on May 11th in the following year. This building was added to from time to time up to the year 1889, but had long been quite inadequate for the accommodation of the increased and increasing number of members. It was pulled down in August of that year; the foundation stone of the new structure was laid in September, and the present handsome pavilion opened to the Club in 1890. Its cost was about £17,500. Mr. William Ward continued to be the proprietor of Lord's Ground until 1836, when James Henry Dark purchased his interest, retaining it until 1864, when he sold his lease, including Tavern, Racquet and Tennis Courts, Billiard Room, &c., to the Club for £11,000.

In or about the year 1860 the freehold of the ground was sold by public auction, and although Dark personally expressed his opinion most strongly to several influential members of the Club that it was most desirable that the Club should become possessors of the freehold, it seemed to be no one's business, and in consequence a Mr. Moses (who afterwards changed his name to Marsden) purchased the fee for £7,000. This supineness on the part of the authorities cost the Club very dear, for in 1866 Mr. Marsden sold them the freehold for the sum of £18,313. The extent of ground thus acquired in 1866 amounted to about eight acres, including the sites of the buildings. In 1874 the Club purchased a slip of land extending from the north side of the ground to St. John's Wood Road and known as Guy's Garden, which brought the area up to nine acres. In 1887—when the Centenary of the Club was celebrated by two special matches and a banquet—the Club purchased for £18,500, from the

Trustees of the Clergy Orphan Corporation, 3¼ acres of land, known as Henderson's Nursery, bounded on the north by Cavendish Road, and on the east by Wellington Road. In 1897 the Manchester, Sheffield, and Lincolnshire Railway Company handed over to the Club the site of the Clergy Orphan Corporation School, extending to about 2¼ acres, and the total acreage, including sites of adjacent properties purchased from time to time, will amount to nearly twenty acres. The experiences at the Test match with Australia in 1896 were such that it became necessary to give increased accommodation for the public, and the picturesque tennis and racquet courts on the south side were pulled down, and the huge Mound Stage to seat about 7,000 spectators was erected, the new tennis and racquet courts being built at the rear of and connected with the pavilion.

LORD'S CRICKET GROUND.

What the number of members was from the Club's formation up to the year 1845 will never be known, and probably Thomas Lord never published any accounts; but in 1845 the number is put at 465. It is not necessary to show how from year to year the number has steadily increased. In 1866 it amounted to 980; in 1876 to 2,188; in 1886 to 3,107; and in 1896 to over 4,000, and there were the names of 9,000 candidates on the books. In 1909 the members were about 5,000. and there were 15,000 to 18,000 candidates on the books. It will be gathered from the foregoing statements that the Marylebone Cricket Club has made steady progress in all respects since its original foundation by Thomas Lord in 1787; its existence has no doubt been in great peril on more than one occasion, but some genuine friend and supporter of cricket has always stepped into the breach. One other record only need be mentioned; in the year 1826 four practice bowlers and two boys were employed in the service of the Club; in 1836, owing to the increase of the number of members, these were increased to five practice bowlers and five boys; and the number of matches played was nine. In 1896 the professional staff amounted to fifty-two, the boys to fifteen, besides extra bowlers; and the number of matches played was 171, whilst in 1909 the ground staff numbered fifty-five, besides the extra bowlers and boys, and the number of matches played was 173. The present secretary, Mr. F. E. Lacey, a Cambridge University and Hampshire cricketer, was appointed in the spring of 1898, on the resignation, after 22 years' service, of Mr. Henry Perkins, who was elected a life member of the Club.

The Oval, Kennington—that is, in its present form of a cricket ground—reached its Jubilee in the middle nineties. Mention of Kennington Oval itself can be found as early as 1818, when the river Effra, which ran on the south side of the ground at the time, overflowed its banks and caused considerable destruction in the neighbourhood. At that time "The Oval" was a market-garden, as it remained for years afterwards. It was still a market-garden in 1844, when the demolition of the Beehive Tavern at Walworth compelled the members of the Montpelier Club, then the largest cricket club on the south side of London, to seek new pastures.

Their choice fell on the Oval, which was then, as it is now, the property of the Duchy of Cornwall. A lease of thirty-one years was granted by the Duchy in 1844 to Mr. William Baker, a local resident of influence, and one of the best cricketers of the period. An entry in the diary of Mr. Briant, of "The Horns" Tavern, shows that the first sod of the new cricket-ground was laid in March of the following year. In the previous autumn a meeting of the old members of the Montpelier Club had been held with the object of forming a County Club for Surrey. The proposal met with considerable favour, so much so that, at a dinner held in the autumn to give effect to the suggestion, seventy members of the Montpelier Club enrolled themselves as members.

With the club once constituted, no time was lost in getting the ground in order, with the result that 1845 saw the first match played on the Oval. The Mitcham Club had the satisfaction of being selected to meet the Montpeliers on this historic occasion, which was not inappropriately celebrated by an exciting game ending in a tie. Yet the Oval in those early days was not altogether secure for cricket. At one time, indeed, bad management had brought the club to such an enfeebled state that it was quite on the cards that it would be broken up and the Oval, as an open space, lost for ever. The generosity of a few enthusiastic sportsmen happily prevented this, but it was still some time before the danger was really over. The vigorous policy of Mr. John Burrup, who succeeded Mr. W. Denison, the original secretary, in 1847, gave the Oval a new tenure of life. The lease of the ground had just then fallen into the hands of the Surrey Club, and the Duchy of Cornwall was induced to grant a term of thirty-one years to three trustees representing the Surrey County Club. Since that time, though there was a succession of bad years from about 1870 to 1882, when Surrey cricket was hardly of the most attractive, the Oval has enjoyed a well-deserved and latterly increasing popularity. In the spring of 1855 another change took place in the secretaryship. Mr. John Burrup, who had held the post with the most beneficial results to the club for eight years, gave it up to his twin brother William. Under the latter's management the Oval soon underwent several much needed improvements. Hitherto the accommodation for players as well as members had been of the most primitive character. All this was changed in 1858. In that year the old pavilion was built, mainly through Mr. W. Burrup's personal influence. For some fourteen years it remained practically in the same condition, while the Surrey eleven were at their best and Surrey cricket was in its palmy days. It has been replaced, in its turn, by the present larger and more commodious structure. But in time Mr. William Burrup's tenure of the secretaryship came also to an end. His resignation suggested the advisability of having a paid instead of an honorary secretary. The selection of the executive fell on an old Harrovian, Mr. C. W. Alcock, who at the time was well known both as a cricketer and a football-player, and who held office till his death in 1907. When he took office in 1872, Surrey cricket was in a bad way altogether. Young players had been to a great extent overlooked, and, as a consequence, for some ten years or so the Surrey eleven had more than their fair share of ill-success. The visit of the first Australian team to England in 1878 had not a little to do with the renaissance of the club, and the memorable match between England and Australia two years later—the first Test ever played in England—brought the Oval again prominently before the public notice. The same season saw another great addition to the accommodation on the ground in the shape of the terraced banks, which have provided such an excellent sight of the game to hundreds on the occasion of big matches of late years. Meanwhile, the experiment of an open stand had been tried with such success that this was in time roofed in and still another covered stand provided. A new wing was added to the pavilion, and the accommodation for members as well as players materially improved. Latterly, the rapid increase in the number of members compelled the committee to consider seriously the necessity, not only of a large and more up-to-date pavilion, but also of a club house with provision for catering for the public frequenting the ground. The result has been that both the old pavilion and stand came down, and in their place were erected new buildings in 1898. For a long time better quarters had been needed, and in view of a match-list increasing year by year the only wonder was that some steps were not taken before. The cost of the present pavilion and tavern, including the decorations and furnishing of the pavilion, was roughly £38,000, whilst the membership on December 31st, 1909, was 3,394. Originally some 11 acres in area, the playing part of the ground is now about 9 acres. With the one exception of Lord's, the Oval has been the scene of more historic cricket matches than any ground in the kingdom, which is as much as to say in the world. The old Oxonian, Mr. W. Findlay, was appointed as Mr. Alcock's successor.

Other Famous Grounds.—**Cambridge University.**—For many years the University has played on the ground which was opened by F. P. Fenner in 1846, and which was known as "Fenner's" till in 1875 the C.U.C.C. leased the ground and added a handsome pavilion. In 1892 the club acquired the freehold. The match enclosure, about five acres, is covered with such beautiful turf that high scoring is the rule rather than the exception. The full size of the ground, now known as "The Cambridge University Cricket Ground," is about eight acres, and 10,000 persons can witness the game with ease.

Derbyshire has its headquarters at Derby, a ground of eleven acres, seven of which are reserved for matches and three for practice. The pavilion and grand stand seat about 1,000, and there is every convenience for the public. The turf, though a little coarse, is grown on good clay marl and wears exceedingly well. Some of the home matches are decided at Chesterfield and Glossop.

Essex has its ground at Leyton, where on a good gravel soil are eleven and a half acres of capital turf, eight and a half acres being reserved for cricket. There is plenty of accommodation for 12,000 persons, apart from the seats in the stands and pavilion, and a bowling green formed in the winter of 1909. Other improvements would be carried out did funds admit.

Gloucestershire.—The County Ground is at Bristol, and comprises fourteen acres and a half of good sound turf, eight of which are reserved for matches. There is a fairly large pavilion and stand. Three county matches are played annually on the Cheltenham College ground, a capital enclosure, these forming the "Cheltenham Festival." Matches are also given to Gloucester, and there is a "Bristol Week."

Hampshire plays several matches annually on the "Officers' Recreation Ground, Portsmouth," a ground famous for good wickets and high scoring, but the majority of the matches take place on the county ground at Southampton, where there is plenty of room for cricket, and on the good, sound turf the average scoring is very high. Bournemouth has also of late received a share, and promotes a successful festival.

Kent distributes its matches among various towns, but the headquarters of the county are at Canterbury, on the famous St. Lawrence ground, where the famous "week," the progenitor of all similar weeks, opens on the August Bank Holiday. The ground, thirteen acres in area, is well-drained and dries fast; the turf is of the best. It was purchased a few years since by the County Club. The ground can hold 14,000 spectators, including some 3,300 in the new pavilion (recently added to) and stands. A "week" is also held at Tonbridge, on the Angel ground, a large and commodious enclosure of excellent turf, at Tunbridge Wells, Dover, and Mote Park, Maidstone, which was made level in 1909, and a handsome pavilion erected. County matches are also played at Blackheath, Catford Bridge, and Gravesend.

Lancashire plays all its matches except two on the famous "Old Trafford Ground," Manchester. The extent of the ground is ten acres, of the match enclosure seven; stands, pavilion, and other buildings occupy the remainder, whilst there are also a practice ground and club match pitch adjoining. The pavilion is a reduced facsimile of that at "Lord's." The turf is admirable, though often very slow, owing to the rainy climate. One of the international matches is always played at Old Trafford. Several county matches are played on the Aigburth Ground, Liverpool, where there is a splendid pavilion and every facility for cricket. About eight acres out of eleven are set apart for matches.

Leicestershire.—The county ground is in the Aylestone Road, and all county matches are played there. The ground, eleven acres in extent, is covered with good turf; and half of it forms the match portion. The pavilion and stand seat 1,500 persons, and there is plenty of seating round the ground.

Lord's is the headquarters of English cricket. From the clayey nature of the soil, the ground is as hard as iron after a succession of hot days, but after rain it is probably the most treacherous in England. [*See* LORD'S and M.C.C.]

Middlesex.—All the home matches of this county are played, by special arrangement, at "Lord's."

Northamptonshire.—The ground is well situated to the north-east of the county town, Northampton, and consists of ten acres. The soil is principally sand, and the wickets, which are usually fast, are all improved by the use of marl. The ground has the reputation of drying very quickly, and soon recovers from the effects of the wet. At one corner of the ground is an imposing-looking hotel, under the control of the club, and on the opposite side is the main pavilion, which is confined to the use of the players and male members of the club only. There is also a ladies' pavilion, a west stand, and a very large stand used in connection with football, as well as cricket. Further extensions of this are contemplated.

Nottinghamshire.—The Trent Bridge Ground, Nottingham, is the home of the county's cricket. It is nine acres in size, six acres forming the match portion, and being covered with excellent turf. The new pavilion, built in 1886, holds some 3,000 spectators, and the ground is surrounded with terraces, provided with seats and roofed.

Oxford University.—For many years the O.U.C.C. used a ground known as "The Magdalen Ground," and belonging to that college; the present ground was acquired in 1880. The total size of "The Parks" is about ten acres, of the match enclosure about five and a half acres; the turf is sound and good under favourable conditions, but is apt to be tricky if the weather is unpropitious. As "The Parks" are public property, no admission fee can be charged, and consequently, when gate-money is required, matches are played elsewhere—on the Christ Church Ground, in the Iffley Road. The pavilion accommodates about 600 persons.

Somerset possesses an excellent county ground at Taunton, with a fine sward of turf, which dries after rain more quickly than any ground in England. It is six and a half acres in size, accommodates 6,000 spectators in "the ring," and 1,000 more in pavilion, grand stand, and ladies' enclosure. About one-half of the home fixtures are now played at Bath, where better patronage is secured.

Surrey.—In "The Oval," Surrey possesses a ground which in fame stands second only to "Lord's," in excellence second to none, the turf being remarkably fine and good, and recovering very rapidly. The ground belongs to the Duchy of Cornwall, and is situated in Kennington. [*See* ANTE.]

Sussex.—The County Ground is at Hove, Brighton, and is famous as being one of the easiest grounds for batsmen. The turf is close and smooth; the ground is level and recovers with marvellous rapidity after rain. The total size is ten acres, six of which form the portion devoted to matches, but so fast is the turf that the six acres seem to shrink into four when the ground is hard. It is the paradise of batsmen and the terror of bowlers. Matches are also played on the good grounds at Eastbourne and Hastings, but the arrangements for the public are necessarily of a temporary character. A fixture is also allotted to Priory Park (Chichester) and Horsham. The "Hastings Week," held in September, has been dropped from lack of support and bad weather.

Warwickshire.—The County Ground is in Edgbaston, a suburb of Birmingham. The size of the ground is twelve acres, of the match enclosure five and a half. There is a capital pavilion, with seats for 2,000 members, and for the general public banked accommodation is provided round the ring. The grand stand holds about 600 persons. The turf is close and thick, and the ground admirably level, but, as the ball does not seem to travel very fast, the ground does not lend itself to rapid scoring. Home games are also allocated to Coventry and Leamington.

Worcestershire.—The County Ground is situated at Worcester, overlooking the Severn and the Cathedral, and is one of the prettiest in England. In extent it is, roughly, 84 yards long by 81 yards wide. In dry weather the wickets are extremely fast. The subsoil is clay, but the ground has been marled, and dries very quickly. In spite of the fact that it is not infrequently flooded in winter, it is one of the easiest county grounds to get runs on. Several home fixtures are given to Stourbridge, Bournville received a fixture for 1910, and Dudley is to be favoured in future.

Yorkshire.—The Bramall Lane enclosure at Sheffield is eleven and three-quarter acres in size, the match enclosure taking up eight of these. The grand stand can seat 3,500 persons, and 25,000 can witness the cricket without inconvenience. Unfortunately the turf has not been always in the best condition, but special attention has been paid to it recently. One drawback to the ground is the bad light which prevails, when the wind blows from certain quarters, as found when the first and possibly only Test match was played there in 1902. County matches are divided with Leeds, Bradford, Dewsbury, Harrogate, Hull, and Huddersfield. The "Scarborough Week," held in September, is a recognised institution, but is not nowadays utilised for inter-county cricket. The Headingley ground at Leeds provides about eight acres of playing surface, with pavilion and stand accommodation for 5,000 people, while fully 30,000 can witness the game in comfort and the turf is of the best quality. The playing area at Bradford is about six acres, the whole ground covering ten. The turf is second to none, the ground is most accessible, and about 30,000 people can watch the game. The pavilion is spacious and contains all necessary conveniences.

Colonial Cricket.—Australian Cricket. Between 1862 and 1878 four English elevens visited Australia, but whereas the first three sides only played against odds, with fifteen, eighteen, or twenty-two men to oppose, the team of 1876—77 played three matches on even terms, a win, a draw, and a loss being the result. This fact first opened the eyes of English cricketers to the possibility of international matches, though even in 1878, the occasion of the first visit of Australian cricketers to these shores, no match was arranged between the visitors and the full strength of the Mother-Country; yet the sensational defeat of a fine M.C.C. team by the visitors in a May afternoon gave some clue to their powers. It was in 1880 that the first England *versus* Australia match was played, the visitors being beaten by five wickets, and since that time the contest has been a regular fixture. In 1884 the number of "test-matches" was raised to three, in 1899 to five. It is not surprising that England should have had considerably the "best of the deal," the results being up to 1909, England sixteen, Australia eight, fifteen having been drawn. In Australia, however, the balance of success lies with the Colonials, but few, if any, of the

England v. Australia at Manchester, 1909.

visiting sides can be said to have been absolutely representative of English cricket, while, from the methods in which such visits are arranged, the Australians have probably a better chance of getting a *nearly* representative side to visit England than England to visit Australia. In all, thirteen Australian elevens have come over to England latterly at, as a rule, intervals of three years, to the great advantage of both countries and of cricket in general.

THE AUSTRALIAN TEAM, 1909.

Mr. H. Carter. Mr. W. J. Whitty. Mr. P. A. McAlister. Mr. J. A. O'Connor. Mr. F. Laver. Mr. R. Hartigan. Mr. A. Cotter.
Mr. V. Trumper. Mr. A. J. Hopkins. Mr. S. E. Gregory. Mr. M. A. Noble. Mr. W. Bardsley. Mr. W. Carkeek. Mr. W. W. Armstrong.
Mr. C. G. Macartney. Mr. V. Ransford.

To compare the cricket of the two countries would present no easy task, but it may be asserted generally that English batsmen, especially on slow and difficult wickets, are superior to the Australian, that Australian bowling is slightly better and Australian fielding and throwing distinctly better than the English, the last two items especially emphasising the fine qualities of the English batsmen. Each country has undoubtedly learned something from the other, whilst a great feature of the Commonwealth players is their grit and determination in playing an uphill game.

Cricket, as played in Australia, differs in a very marked degree from the game as played in England, and from various causes. Possibly the most remarkable feature of Australian cricket is the fact that from her limited number of players she has been able, from time to time, to put an eleven into the field fully capable of holding its own in home and home matches with representative teams of England; and such is her position at the present time. In spite of this, it seems very doubtful whether her second eleven would make anything like such a favourable comparison with the second eleven of England. But she is certainly stronger in this respect than she was; for, particularly in the last few years, there has been a strong advance made in every colony, as is shown by the great increase of clubs and players, as well as by a remarkable improvement in the play, both "up-country" and in the big towns. It is true, however, that about twenty years ago there was a strange decline in the interest taken in the game. The old enthusiasm seemed to be wanting, and even the inter-colonial matches failed to arouse the keenness formerly associated with them. Possibly the non-success of the teams sent home just at that time had served to damp men's interest; possibly the slow style of play then coming into vogue wearied the public taste. Then, somewhat indirectly, the visit of Lord Sheffield's team in 1892 revived the cricket interest that had so long been latent, and the interest has been maintained and even increased ever since. It is only natural that, in view of their paucity of numbers the Australian teams should not have always maintained their highest standard, but however the strength may have varied, there has never been anything commonplace about Australian cricket. Individuals among her players have always stood out prominently in one branch of the game or another, and there are Australian names which, with one great exception, take no second place even among the greatest.

[*Photo. by G. W. Beldam.*

MR. V. TRUMPER.

How does Australia train her men? There are no cricket nurseries such as we have in our public schools, where colts can take advantage of the advice of experienced cricketers, but the facilities for practice are numerous. Most of the cricket in Australia is played upon cement laid upon a brick foundation, with matting stretched over the whole, proper turf being a great rarity. Thus, in the rough land which lies outside the Sydney cricket-ground, there are several cement wickets laid down by the local authorities, where anyone may practise, and this system has been adopted in other quarters to encourage men to learn to play. These cement and matting wickets, though apt to be fiery, are always true and fast, and the bowler can generally get a little work on the ball; also, when they begin to wear out, they can be repaired at a trifling cost; while, further, as they are quite independent of the weather, neither side can plead a "sticky wicket" as the cause of defeat. Again, wherever an open space can be found, a ground can be made fit to play on in a very short time; for a good wicket—which is mainly important—is a great compensation for rough out-fielding. Some grounds, such as the ground at Broken Hill, cannot boast a single blade of grass, but the brown undulating soil is rolled tolerably smooth, and a good cement wicket adorns the middle. In almost every up-country town a ground of this sort, with perhaps rough grass to field on, is to be found. The Adelaide Oval provides perfect wickets, but for fielding is open to improvement. The Melbourne and Sydney Clubs possess as fine turf grounds as exist anywhere, smooth as a lawn all over, and circular in shape. A white wooden paling or railing, three or four feet high, runs round them, and the crowd is never allowed to invade the sacred precinct. The wickets on these grounds are indeed the batsman's paradise—in fine weather. A peculiar black soil is used where the wickets are laid, which becomes as hard as adamant—so hard that even the making of a block-hole is often out of the question—and as true as a billiard table. There are, of course, other turf grounds to be found; but the majority of cricketers have to learn to play on matting and receive their polishing at one of the great cricket centres. For the most part they learn to play by the light of nature, with the advantage of a very long summer and a possibility of practising nearly all the year round.

F. A. TARRANT.

[*Photo. by G. W. Beldam.*

MR. A. COTTER.

To the former is probably due a certain absence of that finished style which we are accustomed to associate with cricketers who have been studiously coached in their youth—not that their skill in any way suffers thereby, but rather is the individuality disposed to be more strongly marked.

One great advantage that the Australians possess is that with their lighter programme they are able to play their matches to a finish. It is the custom, too, at the Melbourne, Sydney, and Adelaide grounds to cover the wicket at night-time with a tarpaulin, so that neither heavy dews nor rain by night may unfairly handicap the batting side during the first hour's play in the morning. Every precaution then is taken that a match may be fought out on a hard wicket. And we may see in this the reason why the Australians enjoy a reputation for appearing at their worst on the slow, sticky wickets that so frequently occur in England. Still, on the whole, it is a distinct advantage for the youth of Australia that they should receive the beginning of their cricket education on true and fast wickets; it is in this that they have the best chance of learning to play with a free, upright style and a straight bat, and to overcome the very natural fear of fast bowling. But this is not an unmixed blessing, as, from want of proper practice on wet and difficult wickets, an Australian side is especially liable to collapse if a match has to be played under these conditions. On the other hand, to these hard wickets is due that remarkable accuracy of length which the greatest Australian bowlers have shown us. By bowling constantly on them, her bowlers learnt what the English bowlers learnt from them—that great accuracy of pitch and subtle variations of pace are the deadliest weapons that a bowler can command. It taught them to exercise greater cunning and to acquire the art of making the ball spin and break even on perfect wickets, and this has always been a more prominent feature among Australian than among English bowlers.

There is at the present time, unfortunately, a strongly marked tendency among colonial cricketers of all classes to adopt a slow, "pottering" style of play. No doubt this development has arisen from the fact that, as all matches are played out to a finish, and no economy of time is necessary, the batsman is apt to overvalue the cricket adage, "If you only stay at the wickets, the runs are sure to come." It is an excellent thing for every team to possess one or two players who can be relied upon never to take a liberty; no less is it ruinous to the interests of the team that most of the members should adopt these tactics, which for the time being almost ruined one English county team, and if encouraged further may imperil Australia's reputation for producing brilliant cricketers, and sadly spoil her "winning brackets" in this country.

[*Photo. by G. W. Beldam.*

MR. CLEM HILL.

There is another external influence acting on the game in Australia which has never failed to make itself felt by the English teams when visiting the country—and that is the light. Visiting teams have invariably had to pay the penalty, particularly in the earlier matches of the tour, for being unable to judge the ball accurately in its flight through the air; and it is no uncommon thing for a deep field, expecting to bring off his catch, to find the ball pitch ten yards over his head, to the huge delight of the crowd. The tropical heat of midsummer also proves a great trial to Englishmen, and so far affects the Australians themselves that the necessity of an interval for tea was recognised, and has been, without quite so much justification, introduced into English cricket. On the other hand, when the Australians visit England, they in their turn suffer from the cold winds of our early summer, and their play must be affected thereby.

[*Photo. by G. W. Beldam.*

MR. M. A. NOBLE.

Another fact that may be noticed by way of comparison is that while one or two members of an English eleven will invariably be found to *jerk* the ball back to the wickets, *all* the Australians can throw, and for the most part with greater force and accuracy than our own players. Doubtless our climatic conditions are accountable for the number of strained arms that exist, but, generally speaking, the Australians have the reputation for being better in the field than we are; and, as it is true that they learn the finer arts of batting from watching English cricketers, no less is it true that the Australians first opened our eyes to the value of smart fielding and hard accurate returns.

The minor cricket of Australia has a peculiarity of its own. Its matches, except when arranged to last for one or two days only, are seldom played out on consecutive days, but are carried on from Saturday to Saturday till they are lost or won. Fortunately the long summer allows of these club fixtures being easily finished in this manner, but a difficulty arises therefrom in that the players have to bind themselves from week end to week end, which involves some inconvenience; and many cricketers, being unable to pledge themselves so far in advance, are debarred from this class of cricket in consequence. Time is more precious, and there are fewer idle men in Australia than in England, so that working days cannot be set aside for cricket, except in the case of the most important matches.

Two more points alone require notice. The first is the almost universal fairness of Australian bowlers; their delivery—possibly one or two exceptions might be made—has been most strictly orthodox. Secondly, the question of umpires deserves a word. In the early days of Australian cricket, when professionals did not exist, and amateurs, with little more experience than a general knowledge of the rules, were pressed into the service, the umpiring was undoubtedly very unsatisfactory, both to the cricketers and the spectators; and as, in inter-colonial matches, each colony provided its umpire, and our system of selecting neutrals had not been adopted, disputes, cessations of play, and even miniature riots took place in consequence, while Australian elevens got rather a bad name for cavilling at the umpires' decisions. Happily this is now a thing of the past. English teams have been unanimous in their praise of the fairness, impartiality, and ability of the Australian umpires; and with this brief allusion to what *has been*, the question may be relegated to its grave for ever. The disputes were doubtless due largely to the amount of public betting that took place on the grounds.

F. G. J. FORD.

ENGLAND *v.* AUSTRALIA.

SUMMARY OF TEST MATCH RESULTS.

Where Played.	Date of First Match.	Won by England.	Won by Australia.	Drn.	Ttl.
Melbourne	1877	8	10	2	20
Oval...............	1880	7	1	4	12
Sydney............	1882	9	11	0	20
Manchester	1884	3	2	4	9
Lord's	1884	4	3	3	10
Adelaide	1884	2	5	0	7
Nottingham ...	1899	1	0	1	2
Leeds	1899	0	1	2	3
Birmingham ...	1902	1	0	1	2
Sheffield	1902	0	1	0	1
In Australia...	1877	19	26	2	47
In England ...	1880	16	8	15	39
Totals.. ...		35	34	17	86

TEST GAMES IN ENGLAND.

	England.	Australia.	Drawn.	Total.
1880	1	0	0	1
1882	0	1	0	1
1884	1	0	2	3
1886	3	0	0	3
1888	2	1	0	3
1890	2	0	0	2*
1893	1	0	2	3
1896	2	1	0	3
1899	0	1	4	5
1902	1	2	2	5
1905	2	0	3	5
1909	1	2	2	5
Totals	16	8	15	39

"CENTURIES" IN TEST GAMES.

For Australia	41
For England	43

ENGLISH TOURS IN AUSTRALIA.

RESULTS OF MATCHES.

		All Matches.			XI a side games.		
Year.	Team.	Wn.	Dn.	Lt.	Wn.	Dn.	Lt.
1861-2	H. H. Stephenson	6	4	2		—	
1863-4	G. Parr	10	6	0		—	
1873-4	W. G. Grace	10	2	3		—	
1876-7	Jas. Lillywhite	11	8	4	1	1	1
1878-9	Lord Harris	5	4	3	2	0	3
1881-2	Alfred Shaw	11	11	3	3	2	2
1882-3	Hon. Ivo Bligh	9	6	3	4	0	3
1884-5	Alfred Shaw	16	15	2	6	0	2
1886-7	Alfred Shaw	12	15	2	6	2	2
1887-8	G. F. Vernon	11	14	1	6	1	1
1887-8	Shaw and Shrewsbury (C. A. Smith)	14	9	2	5	0	2
1891-2	Lord Sheffield (W. G. Grace)	12	13	2	6	0	2
1894-5	A. E. Stoddart	9	11	4	8	0	4
1897-8	A. E. Stoddart	6	11	5	4	3	5
1901-2	A. C. MacLaren	8	8	6	5	0	6
1903-4	M.C.C. (P. F. Warner)	10	8	2	9	3	2
1907-8	M.C.C. (A. O. Jones)	7	8	4	7	7	4

After the New Zealand tour of Lord Hawke's team in 1902-3 three XI a side games were played in Australia, one being drawn and two lost.

AUSTRALIAN TOURS IN ENGLAND.

RESULTS OF MATCHES.

Year.	Captain.		Wn.	Dn.	Lt.	Ttl.
1878	D. W. Gregory	XI a side	9	4	4	17
		all matches	18	12	7	37
1880	W. L. Murdoch	XI a side	5	4	2	11
		all matches	21	12	4	37
1882	W. L. Murdoch		23	11	4	38
1884	W. L. Murdoch		18	7	7	32
1886†	H. J. H. Scott		9	22	8	39
1888	P. S. McDonnell		19	7	14	40
1890	W. L. Murdoch		13	9	16	38
1893†	J. McC. Blackham		18	8	10	36
1896	G. H. S. Trott		19	9	6	34
1899	J. Darling		16	16	3	35
1902	J. Darling		23	14	2	39
1905†	J. Darling		16	19	3	38
1909	M. A. Noble		13	22	4	39

South African Cricket.—If the advance made by Australia has been remarkable, that effected by South Africa is still more so. The earlier English teams, of which that under Major Wharton in 1888-9 was the pioneer, found their task comparatively easy, but the improvement was steady, and following on the tour in England in 1904, during which a fairly powerful "Eleven of England" suffered defeat at Lord's by 189 runs, a series of Test games was arranged during the visit of the M.C.C. team under P. F. Warner for the South African season of 1905—6. The power of the "googly" was demonstrated to the full, and our only victory was in the fourth of the five games. As a result of the glowing accounts given by the tourists, three Test matches on a similar basis to those arranged with the Australians were contested when the Colonials visited us in 1907, and after a curious game at Lord's, in which rain came to the aid of the tourists after a praiseworthy uphill struggle on their part, the Mother-Country won a rather unsatisfactory game at Leeds—the only one of the three in which a definite result was arrived at, for the game at the Oval could not be completed. In the more recent tour of a second M.C.C. team under Mr. H. D. G. Leveson-Gower, our efforts were unsuccessful, though in this case the third and fifth fixtures of the series ended in favour of the visitors. Doubts were expressed, however, as to whether the Colonials were, apart from the wonderful all-round form of G. A. Faulkner, quite so powerful as on the occasion of the previous trip. Possibly, too, the "googly"—specially dealt with in another chapter—has lost some of its terror.

RESULTS OF ENGLAND *v.* SOUTH AFRICA IN SOUTH AFRICA.

	Won by Eng.	Won by S.A.	Total.
1888-9	2	0	2
1891-2	1	0	1
1895 6	3	0	3
1898-9	2	0	2
1905-6	1	4	5
1909-10	2	3	5
Total	11	7	18

IN ENGLAND.

	Won by Eng.	Won by S.A.	Drawn.	Total.
1907	1	0	2	3

ENGLISH TOURS IN SOUTH AFRICA.

RESULTS OF MATCHES.

Year.	Team.	Wn.	Dn.	Lt.	Ttl.
1889-9	Major Wharton's	13	2	4	19
1891-2	W. W. Read's	13	7	0	20
1895-6	Lord Hawke's	7	7	2	16
1898-9	Lord Hawke's	15	2	0*	17
1905-6	M.C.C. (P. F. Warner's)	17	4	5	26
1909-10	M.C.C. (H. D. G. Leveson-Gower's)	10	4	4	18

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* Match at Manchester abandoned through rain.

† Including one game against odds.

* Exclusive of two scratch games (lost).

SOUTH AFRICAN TOURS IN ENGLAND (All Matches.)

Year.	Team.	Wn.	Dn.	Lt.	Ttl.
1894	H. H. Casten's	12	7	5	24
1901	M. Bisset's	13	3*	9	25†
1904	F. Mitchell's	13	10*	3	26
1907	P. W. Sherwell's	21	6	4	31

Records.

(*Corrected to June,* 1910.)

Highest total for one innings in a first-class match—

918 by New South Wales *v.* South Australia, at Sydney, in January, 1901. Five players exceeded the hundred, and there were five three-figure partnerships.

Highest total for one innings in a first-class match in England—

887 by Yorkshire *v.* Warwickshire, at Birmingham, in May, 1896. In this match four men scored over 100 runs (one of them over 200).

Highest individual score in a first-class match—

424, by A. C. MacLaren for Lancashire *v.* Somerset, at Taunton, in July, 1896.

Highest aggregate in a first-class match—

1,911, for 34 wickets, made at Sydney in January, 1909, in a match between New South Wales and Victoria. This game lasted into the sixth day, and seven men scored three figures.

Highest aggregate in a three-days' match in England—

1,492, for 33 wickets, made in July, 1904, in a match between Worcestershire and Oxford University, at Worcester.

Highest individual scores (any match)—

628 (not out), by A. E. J. Collins, in a house-match at Clifton College in June, 1899, extending over five afternoons.

566, by C. J. Eady, for Break-o'-Day *v.* Wellington, at Hobart, Tasmania, in March and April, 1902, extending over four afternoons.

485, by A. E. Stoddart (July, 1886) for the Hampstead Club *v.* The Stoics.

Highest total ever made in a single innings—

1,094, by Melbourne University *v.* Essendon, at Melbourne, March, 1898.

The largest number of runs produced by the partnership of two men in a first-class match is—

554, made by Brown (J. T.) and Tunnicliffe (J.) for the first wicket of Yorkshire *v.* Derbyshire, at Chesterfield, in August, 1898.

The largest number of runs produced by the partnership of two men in any match is—

623, made by Captain Oates and Private Fitzgerald, for 1st Royal Munster Fusiliers *v.* Army Service Corps, at the Curragh, June, 1895.

The longest stand made, in first-class cricket, for the last wicket is—

235, made by Woolley (F. E.) and Fielder for Kent *v.* Worcestershire, at Stourbridge, in July, 1909.

Smallest totals for one innings in a first-class match—

12, by Oxford University (one man absent) *v.* M.C.C. and Ground, at Oxford, in May, 1877, and by Northamptonshire *v.* Gloucester, at Gloucester, in June, 1907.

C. B. Fry has obtained two separate hundreds in a first-class match on four occasions, W. G. Grace, Hayward (T.), R. E. Foster, G. L. Jessop, Tyldesley (J. T.), and Denton (once in South Africa) each on three occasions.

C. B. Fry in 1901 scored thirteen "centuries" in first-class cricket (eleven of these for Sussex), and Hayward in 1906 thirteen (all being for Surrey).

The largest number of hundreds made in first-class matches by any cricketer is *one hundred and twenty-six,* credited to W. G. Grace, the first being 224, not out, made in 1866 for England *v.* Surrey.

The furthest distance, properly authenticated, to which the ball has been hit before reaching the ground is 175 yards, by the late Rev. W. Fellows, at practice on the Christ Church ground, Oxford, in 1856.

England v. Australia (and see *ante*).

Highest totals by England—577, at Sydney (1903-4) and 576, at the Oval (1899).

Highest totals by Australians—586, at Sydney (1894-5), and 551, at the Oval (1884).

Highest aggregate—1,541 for 35 wickets, at Sydney (1903-4).

Lowest totals by England—45, at Sydney (1886-7), and 53, at Lord's (1888).

Lowest totals by Australia—36, at Birmingham (1902), and 42 at Sydney (1887-8).

Highest individual innings for England—287, by R. E. Foster, at Sydney (1903-4), and 170 by W. G. Grace, at the Oval (1886).

Highest individual innings for Australia—211, by W. L. Murdoch, at the Oval (1884), and 201, by S. E. Gregory, at Sydney (1894-5).

W. Bardsley scored 136 and 130 for Australia *v.* England, at the Oval (August, 1909).

Highest first wicket partnership for England—185, by the Hon. F. S. Jackson and Hayward, at the Oval, August, 1899.

Highest first wicket partnership for Australia—180, by S. E. Gregory and W. Bardsley, at the Oval, August, 1909.

Australian Tours in England (and see *ante*).

Highest total against an Australian team—576, by England, at the Oval, August, 1899.

Highest total by an Australian team—843, *v.* Past and Present of Oxford and Cambridge Universities, at Portsmouth, July, 1893.

Lowest total against an Australian team—17, by Gloucestershire, at Cheltenham, August, 1896.

Lowest total by an Australian team—18, *v.* M.C.C. and Ground, at Lord's, June, 1896.

Highest individual score by an Australian in England—303 (not out), by W. W. Armstrong, *v.* Somerset, at Bath, July, 1905.

Highest individual score against an Australian team in England—228, by Gunn (W.), for the Players, at Lord's, June, 1890.

Oxford v. Cambridge (1829—1909).

Oxford 31, Cambridge 36, drawn 8. Total: 75 matches.

Highest individual scores—172 (not out), by J. F. Marsh, for Cambridge, in 1904, and 171, by R. E. Foster, for Oxford, in 1900.

Highest totals for one innings—503, by Oxford, in 1900, and 392, by Cambridge, in 1900.

Eton v. Harrow (1805—1909).

Eton 31, Harrow 35, drawn 18. Total: 84 matches.

Highest individual scores—183, by D. C. Boles, for Eton, in 1904; 152, by Sir Emilius Bayley, for Eton, in 1841; and 142, by T. G. O. Cole, for Harrow, in 1897.

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* Including one tie. † Exclusive of two holiday games.

ENGLISH FIRST CLASS CRICKET.

THE LEADING BATSMEN SINCE 1892.

Year.	Batsman.	Inns.	Times not out.	Runs.	Aver.
1893	Gunn (W.)	51	3	2,057	42·85
1894	Brockwell (W.)	45	6	1,491	38·23
1895	A. C. MacLaren......	24	0	1,229	51·20
1896	K. S. Ranjitsinhji ...	55	7	2,780	57·91
1897	F. G. J. Ford	18	3	805	53·66
1898	Quaife (W. G.)	28	8	1,219	60·95
1899	Major R. M. Poore..	21	4	1,551	91·23
1900	K. S. Ranjitsinhji ...	40	5	3,065	87·57
1901	C. B. Fry	43	3	3,147	78·67
1902	Shrewsbury (A.)	32	7	1,250	50·00
1903	C. B. Fry	40	7	2,683	81·30
1904	K. S. Ranjitsinhji ...	34	6	2,077	74·17
1905	C. B. Fry	44	4	2,801	70·02
1906	C. J. Burnup	21	3	1,207	67·05
1907	C. B. Fry	34	3	1,449	46·74
1908	B. J. T. Bosanquet...	22	2	1,081	54·05
1909	J. R. Mason	14	2	783	65·25

W. G. Grace was to the fore in 1866, '68, '69, '70, '71, '72, '73, '74, '76, '77, '79, and '80.

No one playing less than a dozen completed innings is taken into consideration.

Glossary of Terms.

Analysis (Bowling).—The record of a bowler's performance during a game (*see* p. 481).

Average (Batting).—The record of a batsman's performances during the season. Calculated by dividing the total number of runs by the number of completed innings; in the case of "not out" the runs are reckoned, but the innings is not, *e.g.*,

	Innings.	Times not out.	Total runs.	Average.
Ranjitsinhji	55	7	2,780	57·91

Here the total of 2,780 is divided by 48, *i.e.*, 55 minus 7.

Average (Bowling).—The record of a bowler's performances during the season. Calculated by dividing the number of runs scored off his bowling by the number of wickets captured, *e.g.*,

	Overs.	Maidens.	Runs.	Wickets.	Average.
Hearne (J. T.)	2,003	818	3,670	257	14·28

"Maidens" do not affect the average.

Back-play.—Playing the ball by drawing the bat backwards.

Back-stop—Long-stop (*q.v.*).

Back-up.—To follow up the ball when non-striker, so as to get a start in event of a run being possible.

Bailer.—A ball which removes one or both bails without disturbing the stumps.

Boundary.—The limits of the match-inclosure.

Bowling-crease.—[*See* Law 7.]

Break.—A change of direction taken by the ball after touching the ground.

Break-back.—A ball which, as delivered by a right-handed bowler, twists from "off" to "leg." With a left-handed bowler the ball breaks from "leg" to "off."

Bump-ball.—A ball which after being struck by the bat strikes the ground before it reaches a fieldsman.

Bye.—A run made when the ball has not touched the bat or person of the batsman, and "no-ball" or "wide" has not been called.

C and B.—Caught and bowled (*q.v.*).

Call.—To shout to the other batsman to run.

Carry bat.—To be "not out" at the cessation of play.

Catch.—(i.) To hold the ball, when hit, before it touches the ground.

(ii.) The holding of the ball, so struck.

(iii.) A man is described as a good or bad "catch" who generally holds or fails to hold such a ball.

Caught and Bowled.—Caught by the bowler who delivered the ball.

Century.—An innings of 100 or more runs.

Chance.—An opportunity given by the batsman to the fieldsman to get him out.

Change-bowler.—A bowler who is only invited to bowl when presumably better men have failed.

Change ends.—To bowl from one wicket, having previously bowled from the other. [*See* Law 14.]

Clean bowled.—To be bowled by a ball which hits the wickets without previously touching the bat or person.

Closure.—Declaring an innings at an end. [*See* Law 54.]

Colts.—Young and untried cricketers.

Colts'-match.—A match in which one at least of the sides is composed of young and untried cricketers.

Country.—To field or be caught in "the country" is to field or be caught at either "long-on" or "long-off."

Cover-point.—A fieldsman on the off-side, somewhat in front of the batsman, dealing with hits out of reach of point.

Cross Bat.—A bat held in a horizontal position.

Cut.—(i.) A stroke on the off-side made chiefly with the wrists (*see* p. 455).

(ii.) To strike the ball as described.

Cut-over.—To be struck by the ball in the groin.

Cut up (the wicket).—To spoil the turf where the ball is likely to pitch, by running over it.

Daisy-cutter.—The same as "sneak" or "grub." A ball pitched close to the bowler's foot, which runs along the ground without bounding.

Dead.—The ball is "dead" when it is out of play. [*See* Laws 13, 34, 35, 41, 50.]

Declare.—To close an innings. [*See* Law 54.]

Delivery.—(i.) The method and action of the bowler.

Double wicket.—The game as usually played.

Draw.—(i.) To remove the stumps.

(ii.) To leave the game undecided.

(iii.) An undecided, or "drawn" game.

(iv.) An extinct stroke on the leg-side (*see* p. 457).

Drive.—(i.) A hard hit in front of the batsman (*see* p. 454).

(ii.) To make such a hit.

(iii.) A bat "drives" when the ball flies easily off its face, without jarring the hands.

Ducks-egg.—An individual innings of 0.

Extras.—Any runs not made from the bat.

Field.—(i.) The match-inclosure.

(ii.) The fieldsmen, collectively or individually.

(iii.) To act as a fieldsman.

First-class Cricket.—Cricket played between two sides, *both* of first-class rank as decided by the M.C.C. It comprises the games between the selected Counties, the Universities, the Australians, South Africans, and of the M.C.C. with any of the above. Certain other matches (*e.g.*, North *v.* South and Gentlemen *v.* Players) are annually included.

Follow on.—A side "follows on" which, under Law 53, has two innings consecutively.

Forward-play.—Advancing the bat and foot to meet the ball (*see* p. 453).

Full-pitch or **Full-toss.**—A ball which hits the bat or wicket without touching the ground.

Get up.—A ball "gets up" which rises abnormally high from the pitch.

Googly.—A ball delivered with a leg-break action but breaking from the off.

Go with the arm.—A ball "goes with the arm" when on touching the ground it goes across the wicket in the same direction as the bowler's arm swings (*see* p. 466).

Ground.—(i.) The space behind the popping-crease, which is the batsman's "ground."

(ii.) The professionals, collectively, attached to a club, *e.g.*, "Surrey Club and Ground."

Ground-man.—The man whose duty it is to look after the playing area.

Grub.—[*See* DAISY-CUTTER.]

Guard.—The place where the batsman puts his bat to guard his wicket.

Half-cock stroke.—A forward stroke suddenly checked, so that the ball strikes the bat and is not struck by it.

Hands.—An old term for "innings."

Hang.—A ball "hangs" which rises unexpectedly slowly from the pitch.

Half-volley.—A ball which is met by the bat the instant after it leaves the ground.

Hat-trick, Hat.—A white hat used to be given to the bowler who got three batsmen out in successive balls (whether in the same over or not), provided that they were bowled, caught, stumped, leg-before, or hit-wicket. A bowler who performs this feat is said to "get a hat," or to "do the hat-trick."

Hook.—To hit the ball from the off-side to the on-side in the direction of square-leg.

Innings.—The stay of a side or an individual at the wickets.

Late cut.—A cut (*q.v.*) which sends the ball considerably behind the wickets.

Leg, Leg-side.—The side of the wicket on which the batsman stands.

L.B.W.—Leg before wicket. [*See* LAW 24.]

Leg-break.—A twist of the ball by the bowler from the leg-side to the off-side.

Leg-hit.—A hit to the leg-side, either square with the wicket or behind it.

Length.—The distance from the batsman at which the bowler pitches the ball.

Life.—If a fieldsman misses an opportunity of catching, stumping, or running out the batsman, he is said to give him a "life."

Lobs.—Slow under-hand bowling.

Long-hop.—[*See* SHORT.]

Long-leg.—A fieldsman deep on the on-side, behind the batsman.

Long-off.—A fieldsman deep on the off-side, in front of the batsman.

Long-on.—A fieldsman deep on the on-side, in front of the batsman.

Long-slip.—A fieldsman deep on the off-side, behind the batsman.

Long-stop.—The fieldsman who stands behind the wicket-keeper to save byes; now dispensed with in good class matches.

Lost ball.—A ball hit away which cannot be recovered. [*See* LAW 34.]

Maiden over.—An over from which no runs are scored off the bat.

Mid-off.—A fieldsman on the off-side, in front of the batsman.

Mid-on.—A fieldsman on the on-side, in front of the batsman.

Middle.—Guard that covers the middle stump.

Middle and leg.—Guard that covers the middle and leg stumps.

Mid-wicket.—Another name for mid-on or mid-off, standing close up.

No-ball.—A ball improperly bowled. [*See* LAWS 11, 13, 16, 17, 48A, and 48B.]

Notches.—An old name for runs, which used to be scored by notches cut on a stick.

Not out.—One batsman is necessarily "not out" in a double-wicket match. If the match is won by "wickets" [*See* WICKETS], two are "not out."

Off, Off-side.—The opposite side to the "leg-side" (*q.v.*).

Off-break.—A twist of the ball by the bowler from the off to the leg-side.

Off the wicket.—A ball not straight for the wickets.

One-leg.—Guard that covers the leg-stump only.

Over.—A series of six balls delivered alternately from either end.

Over the wicket.—Bowling so that the delivering arm passes over the wicket.

Overthrows.—Runs scored after the ball has been thrown to the wicket-keeper or bowler but not stopped.

Pitch.—(i.) The ground between the wickets.

(ii.) Synonymous with "Length" (*q.v.*).

(iii.) Almost synonymous with "to bowl." To make the ball strike a particular spot.

Place.—To hit the ball intentionally out of a fieldsman's reach.

Play on.—To hit the ball on to one's wicket.

Players.—Professionals as opposed to amateurs.

Point.—A fieldsman on the off-side, square with the wickets.

Popping-crease.—[*See* LAW 8.]

Pull.—[*See* HOOK.]

Return the ball.—(i.) To throw it to bowler or wicket-keeper.

(ii.) To hit it back to the bowler, especially used of a c and b. (*q.v.*).

(iii.) A sharp straight throw is known as a good "return."

Return-crease.—[*See* LAW 7.]

Round-arm bowling.—Bowling in which the hand is raised level with or over the shoulder.

Round the wicket.—The opposite to "over the wicket" (*q.v.*).

Run out.—(i.) A batsman is "run out" who, in trying to score a run or runs, fails to reach the popping-crease before the wicket has been struck. [*See* LAWS 2 and 49.]

(ii.) A hit is "run out" when the batsmen actually run all the runs gained by the stroke, no allowance being made for boundaries or "lost ball."

Set.—A batsman is "set" who has been in so long that the bowling seems easy and familiar.

Shooter.—A ball which on touching the ground keeps very close to the turf, often with an increase of pace.

Short, Short ball, Short-pitched.—A ball which pitches too far from the batsman to be a good length, and can be well punished.

Short-leg.—A fieldsman on the on-side, nearly square with the batsman or behind him but close to him.

Short-slip.—A fieldsman behind the batsman, on the off-side, and close to him.

Silly.—Applied to point, mid-on, and mid-off, when they stand dangerously near to the striker.

Skyer.—A ball hit very high into the air.

Slog.—To hit hard and indiscriminately.

Sneaks.—[*See* DAISY-CUTTER.]

Snick.—To hit the ball with the edge of the bat instead of the face of it.

Spectacles.—Two scores of 0, made in the same match by the same batsman.

Spin.—An acceleration of rotary movement acquired by the ball after touching the ground.

Spot.—To bowl "on the spot" is to bowl a good "length" (*q.v.*). A bowler is said to have "found a spot," when he continuously pitches the ball on a broken patch of ground, which makes the ball break or rise unnaturally.

Square-leg.—A fieldsman on the leg-side, square with the wicket.

Steal runs.—To get a run for a hit, when no run seems reasonably possible.

Sticks.—A colloquial term for the stumps.

Straight-bat.—To play the ball with the bat perpendicular or nearly so, presenting full front to attack.

Stump.—One of the wickets.

Stump out.—To get the batsman out under LAW 23.

Substitute.—Under certain conditions [*See* LAWS 37 and 40] a batsman or fieldsman may have a man to represent him.

Swipe.—Synonymous with "slog" (*q.v.*).

Tail.—The batsmen who go in late, and are generally less skilful as such than their predecessors.

Talent-money.—Money given to a professional as a reward for special success.

Telegraph—An apparatus for showing the state of the score.

Third man.—An extra fieldsman on the off-side, behind the batsman.

Thrown out.—Synonymous with "run out," provided that the fieldsman hits the wicket with the ball. The term is not used now in the score-sheet.

Tice.—[*See* YORKER.] The term is obsolete.

Timing the ball.—Hitting it at the precise moment when it can be effectively struck (*see* p. 454).

Trial-ball.—An obsolete term. The first ball of an innings, from which the batsman could neither make runs nor be out.

Two-leg.—Synonymous with "middle and leg."

Under-hand bowling.—Bowling with the hand close to the body, and not raised level with or over the shoulder.

Wicket.—(i.) One of the stumps.

(ii.) The ground between the stumps.

(iii.) The batsman is sometimes, by inference, described as a wicket, *e.g.*, "two wickets are down" means "two batsmen are out."

Wicket-keeper.—The fieldsman immediately behind the wickets.

Wickets.—(i.) The three uprights and the two bails which are laid on the grooves are collectively called the wickets or wicket. The stumps are known as the off, middle, and leg stumps; the bails as the off and leg bails. [*See* LAW 6.]

(ii.) A side is said to win by, say, four wickets when the number of runs necessary to win the match have been got, and only six batsmen are out.

Wide.—A ball so badly directed that the batsman cannot reach it. [*See* LAWS 12 and 16.]

Win in an innings.—To make more runs in one innings than the other side makes in two.

Work on the ball.—Identical with break.

Yorker.—A ball which pitches far up; roughly speaking, between the bowling and popping creases.

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